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APPRAISAL OF CALIFORNIA AGRICULTURAL PRODUCTIVE CAPACITY ATTAINABLE IN 1955

by

Trimble R. Hedges and Warren R. Bailey

Results of a Cooperative Investigation Conducted in California by the California State Committee on Survey of Agricultural Productive Capacity. This Committee Included Representatives of the University of California, the United States Department of Agriculture, and State Agencies.

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Preface

The California segment of the cooperative nation-wide survey of agricultural productive capacity was initiated in May, 1951. The Director of the California Agricultural Experiment Station appointed a state committee for the study at the request of the Joint Land-Grant College-Department of Agriculture Committee on Appraisal of Agricultural Productive Capacity. A regional meeting of state committee chairmen from the eleven western states met with representatives of the Joint Land-Grant College-Department of Agriculture Committee in the following week, June 4 and 5, to standardize procedure and synchronize the work in the several states.

The initial meeting of the California State Committee was held on July 6 when detailed plans were made to proceed with the analysis. Subcommittees were established on (1) Crop and Livestock Statistics, (2) Crop Production, (3) Livestock Production, and (4) Labor and Machinery. The Crop Production Committee later was subdivided into three groups to study Agronomic Crops, Truck Crops, and Fruit Crops. All available relevant data were assembled for use by the various subcommittees in surveying the agricultural productive capacity of the state. This data-collecting process occupied the various subcommittees throughout the months of August, September, and October.

The work of the various subcommittees proceeded as rapidly as availability of data and the demands of regular duties on the time of committee members would permit. The study would have been impossible without the full cooperation furnished by members of the committees. Special credit is due the various subcommittee chairmen. Thanks also go to the many research workers and specialists who cooperated with the several subcommittees. These people furnished much valuable information.

The chairman also extends his appreciation to the California Crop and Livestock Reporting Service, the Production and Marketing Administration, the Soil Conservation Service, the Bureau of Agricultural Economics, and to other agencies and individuals too numerous to name whose assistance facilitated this study. The chairman accepts responsibility for the text of the following report but gives full credit to the people and agencies named whose efforts made the report possible.

The following persons were members of the California State Committee and members of subcommittees as indicated:

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SUMMARY

This report is based on a study of California's agricultural productive capacity that can be attained by 1955. The study was made by a committee of professional workers representing every phase of production. It was part of a nation-wide study recommended jointly by the Association of Land-Grant Colleges and the Department of Agriculture.

Projections made for 1955 assume high level economic activity, generally favorable farm prices, adequate supplies of production materials, but a somewhat smaller farm labor force. They also assume that certain improved farming practices and certain new technology will be available or more widely used by farmers in 1955. Finally, they assume that higher levels of production, to be attainable, must be profitable to farmers. This was the guiding principle in projecting (a) allocation of land and other resources among commodities, (b) new practices and technology, and (c) yields of crops and production of livestock.

The study reveals that California's agricultural plant is highly flexible. It can be quickly redirected toward greater output of commodities that might be in short supply during an emergency. Large shifts in the acreage of cotton, alfalfa, feed grains, rice, sugar beets, and canning tomatoes between 1950 and 1951 demonstrate this flexibility. But any major expansion in even a few commodities would mean a diversion of productive resources from other commodities.

The study also indicates that California's productive capacity can be increased considerably. However, any substantial increase must come largely from greater efficiency in production rather than from additional land resources. The committee estimated only a 3 or 4 per cent expansion of acreage in harvested crops between 1950 and 1955. Even the current and planned development of irrigation on new lands is of relatively minor significance in the state's total production albeit a significant factor in certain crops and areas.

The projected adjustments in major uses of cropland compared to 1950 and 1951 may be summarized as follows:

	Estimated for		Projected
	1950	1951	1955
	million acres		
Intertilled crops	1.9	2.5	2.4
Close growing crops	3.9	3.6	3.8
Hay and (crop) pasture	2.0	1.9	2.2
Fruit and nuts	1.5	1.5	1.5
Total land cropped	9.3	9.5	9.9
Summer fallow	1.2	1.1	1.0
Total cropland	10.5	10.6	10.9

These projections for 1955 represent a more intensive use of our cropland than in 1950 when acreage limitations existed in cotton and rice. But the projections represent less intensity than in 1951 when overexpansion occurred in certain crops. Considerable readjustments are indicated from the 1951 situation if trends toward more livestock production are to be realized. The suggested shifts are from cash crops into feed grains, hay, and pasture.

The projected shifts in acreage for selected crops are:

	Estimated for		Projected
	1950	1951	1955
	thousand acres		
Cotton	586	1,341	1,250
Rice	240	319	250
Dry edible beans	319	339	320
Sugar beets	218	149	175
Potatoes	123	84	90
Canning tomatoes	76	145	120
Feed grains	3,617	3,196	3,465
Hay and (crop) pasture	2,024	1,917	2,245
Fruits and nuts	2,246	2,275	2,294

Cotton and rice were overexpanded in 1951 in terms of sustained land use and sound management policies. Some ill-equipped growers got into cotton and the crop expanded onto some lands less suited to cotton than other crops. Adequate irrigation water is a question in some areas. Projections for sugar beets represent a needed readjustment from 1951 when acreage declined due to unfavorable weather in the 1950 harvest. The 1951 bean acreage was above average due partly to inability of farmers to plant intended acreage of other crops. Potato acreage was cut back sharply in 1951 in reaction to overexpansion in 1950. But the cutback was too great; the projected acreage seems more nearly in line with probable market demand. The 1951 acreage of canning tomatoes was overexpanded in terms of probable future market demand. The 1951 acreage of feed grains, hay, and pasture were all too low in view of an expanding livestock industry. The acreage of fruits and nuts cannot be expanded quickly and no large expansion appears warranted.

Improved production techniques will lead to significantly higher yields per acre of certain field crops by 1955. Compared with 1950, the projected increase will be 15 per cent for cotton, 15 per cent for ladino seed, 10 per cent for early potatoes, 9 per cent for sugar beets, and 3 per cent for alfalfa hay.

For certain other field crops, no new technology is in prospect that would raise yields significantly. In this category are the cereals, dry edible beans, late potatoes, flaxseed, and the minor hay crops. However, a gradual improvement in general farming practices would have some effect on yields.

Castor beans and safflower are so new to California that little is known about their possibilities; therefore, future yields were not projected. However, if emergency demand should warrant, the production of these crops could be greatly increased with adequate price incentives.

The committee pointed out that marketable production of most vegetables and fruits could be increased on present acreages by harvesting and marketing a larger proportion of the tonnage now produced. Among the vegetable crops, only carrots are likely to experience higher yields--from use of pelleted seed, greater plant populations per acre, and improved marketing techniques. Somewhat higher yields per acre of prunes can be expected by pulling out marginal acreage and old orchards. Higher average yields of almonds and walnuts will result from a shift in acreage to more productive areas.

Open permanent pasture and range in farms is a highly important grazing resource as it represents more than 40 per cent of the total grazing in California. On the 18 million acres of this land, a highly significant increase in grazing (from 0.55 to 0.60 animal unit months per acre) can be expected by 1955. Although that increase is small compared with the maximum potential improvement, the improved range management practices needed to attain the potential are difficult to accomplish. Such practices, not equally applicable to all lands, include rotation grazing, reseeding, water development, and fertilization. About one-seventh of California's grazing capacity is on public and private range not in farms. While such range also has great possibilities of improvement, not much progress can be expected by 1955.

About one-fifth of California's total grazing capacity is on irrigated pastures and another one-fifth represents crop residues of various kinds. The average grazing capacity on irrigated pasture is expected to increase from 8.0 to 9.0 animal unit months per acre. No increases in production of crop residues are projected but it is noted that only a fraction of such potential feed is now utilized and any greater use is difficult to accomplish.

California's livestock production is partially dependent upon feed grains and concentrates shipped in from other states. It is estimated that some 36 per cent of the grain requirements in 1950 were imported. According to 1955 projections, this proportion would increase to 50 per cent. The 1955 projected production of feed grains would be some 9 per cent below 1950. Thus, even larger inshipments of feed grains would be necessary to attain the projected levels of livestock production. It should be noted that grain used for food and industrial purposes plus that exported from California seaports is roughly equivalent to half our total production.

California's hay production is within 3 or 4 per cent of being in balance with requirements. The alfalfa hay shipped into the state just about equals the 150,000 tons of hay dehydrated or otherwise used in commercial mixed feeds. The projected 1955 production of hay is about 9 per cent above 1950 and will be adequate for our livestock needs.

California's livestock industry has a relatively strong competitive position because the state is a deficit producing area. Nevertheless, production must be efficient because costs of feed and labor are high. The projected 1955 level of production (compared to 1950) would represent increases of 10

per cent in cattle and calves; 18 per cent in sheep, lambs, and wool; 9 per cent in hogs; 9 per cent in milk; 31 per cent in chickens raised; 60 per cent in commercial broilers; 11 per cent in eggs; and 22 per cent in turkeys. In general, most of the additional production is expected to come from an expansion in number of producing animals rather than any marked increase in efficiency per unit. Some further efficiency can, of course, be expected from gradual improvement in breeding, disease and parasite control, and better balanced rations.

The projected high levels of California's agricultural production are dependent upon ample supplies of machines, irrigation equipment, feeds, fertilizers, pesticides, and related materials. Adequate labor is of prime importance although, as the study shows, mechanization is reducing the labor requirement for some crops--notably cotton and sugar beets.

Additional numbers of specialized farm machines needed above 1950 levels include 5,000 more cotton pickers, 2,300 nut harvesters, 2,000 pruning rigs, and 500 agricultural airplanes. Many additional pickup balers, bale loaders, and field forage harvesters also will be required. Moreover, large numbers of replacement machines covering the whole range of farming will be required annually to maintain farm production. And, finally, adequate supplies of repair parts are of signal importance.

The projected production also would require more fertilizer than was used in 1950. The 1955 requirements would be 37 per cent (56 thousand tons) more nitrogen (N), 70 per cent (42 thousand tons) more phosphate (P_2O_5), and 10 per cent (one thousand tons) more potash (K_2O). Cotton and barley would account for most of the additional nitrogen, and general field crops would account for most of the phosphate. Vegetables and fruits already are fertilized at near optimum levels.

APPRAISAL OF AGRICULTURAL PRODUCTIVE CAPACITY ATTAINABLE IN 1955

by Trimble R. Hedges and Warren R. Bailey[1]

This report resulted from a recommendation by the Experiment Station Committee on Organization and Policy and the Joint Land-Grant College-Department of Agriculture Committee on Appraisal of Agricultural Productive Capacity. This group agreed unanimously that a cooperative nation-wide appraisal of agricultural productive capacity should be made. The purpose of this study was to make such an appraisal--to project what level of farm production is capable of attainment in 1955 under an assumed set of conditions. The advantages of such a study were summarized as follows:

> "A study of productive capacity and of the most efficient means of achieving the needed output of food and fibre would provide a guide for the more effective planning of agriculture's part in the mobilization program. More specifically, it would also provide information on labor and the quantities of fertilizer, machinery, and other materials needed for increased production and would serve as a guide for development of educational and research programs that should be given additional emphasis."[2]

The facts and analyses included herein have been assembled and prepared by the California State Committee on Survey of Agricultural Productive Capacity operating through subcommittees for the several fields of production.[3]

Standard forms prepared and furnished by the Department of Agriculture were used in the study with the slight modifications necessary to facilitate the work in California. Those forms and the required data are the basis for the tables included herein.[4] The California Crop and Livestock Reporting

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1/ Trimble R. Hedges, Associate Agricultural Economist in the Experiment Station, University of California, was chairman of the committee responsible for preparing this report. Warren R. Bailey, Agricultural Economist, Bureau of Agricultural Economics, USDA, was a member of the committee and assisted in the writing of this report.

2/ R. M. Trullinger, Chief, Office of Experiment Stations, USDA, letter to Director of California Agricultural Experiment Station, May 18, 1951.

3/ Membership of the State Committee is shown in the Preface.

4/ The several tables were designated as "forms," and the basic outlines for their organization supplied by the Department of Agriculture were used in the preliminary report to the National Committee. The present organization and identification of tables were considered more effective, however, and, therefore, are being used in this report. Footnotes are used to identify the data according to the earlier report.

Service made available to the committee the current basic data for use in projecting future attainable crop and livestock production.5/ Much of the basic information was assembled by crop reporting districts. In addition, land use capability classification data were obtained from the Soil Conservation Service; fertilizer use data came from the Production and Marketing Administration; all other available analytical data such as land use studies, irrigation practice, and analyses of census data were furnished by the Bureau of Agricultural Economics and other agencies.

The main work of the committees involved locating, bringing together, and interpreting research findings from the various technologists in the Experiment Station. Much empirical information regarding farm conditions and practices also was obtained from Extension workers and other educational workers in agriculture and from people in the industries and trades associated with agriculture. Finally, it was the responsibility of the committee to project the various estimates which were prepared first for 1952 and ultimately for 1955. These data appear in this report in terms of 1950, 1951, and 1955 comparisons. Acreage of the various crops and other land uses, numbers of livestock, and yields and production rates represent the key information measuring agricultural productive capacity and the changes necessary to reach the 1955 attainable.6/ A great deal of supporting data is included in terms of research findings and 1950 levels of use and 1955 requirements for fertilizers, pesticides, farm machinery, labor, feed, and other resources.

BASIC CONDITIONS ASSUMED

This study required certain projections for the future. It, therefore, demanded a definite framework of conditions, the context within which the projections were prepared.7/ The various subcommittees attempted, with one exception noted below, to hold their work consistent with the standard assumptions and procedures approved by the Joint Land-Grant Colleges-Department of Agricultural Committee. The conditions assumed by that group were comprehensive and quite specific. They were concerned with the over-all level of

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5/ Estimates of crop acreage and yields and of livestock numbers and production were furnished by the California Crop and Livestock Reporting Service. These estimates have since been revised in line with the 1950 Census, but such revisions were not available early enough to permit their inclusion in this report.

6/ The Crop and Livestock Statistics Subcommittee was responsible for developing the procedure to provide the basic data required for the entire study. Membership included J. R. Conrad (Chairman), Warren R. Schoonover, George A. Scott, Leonard R. Wohletz, and E. L. Haff (Secretary).

7/ The word "projections" is used advisedly instead of the word "estimates." The data herein are not estimates of what production will be attained in 1955; they represent projections of what is considered capable of attainment under the basic conditions assumed.

BASIC CONSTRUCTION LESSONS

economic activity, the specific price relationships directly affecting agriculture, the availability of farm resources, management capacity and policies of farm operators, and the effectiveness of farm research and educational programs.

General Economic Conditions

It was assumed for the economy as a whole that (1) full employment is to continue and (2) a high level of the income is to exist (Table 1). These conditions are expected to accompany a continuing high level of defense activity and spending. It was assumed regarding agriculture that (3) "...the general level of prices assumed, and the parity ratio, will thus reflect a favorable cost-price relationship for farmers; it is suggested that farm prices and farm costs reflect a parity ratio of 105 to 110"; (4) "the total labor force available to agriculture will be somewhat less than in 1951." It was estimated that farm employment might be about 9⅔ million workers in 1955 as compared with 10.4 million in 1950.8/ (5) "Production resources other than land and labor will be available in quantities needed to achieve potential production." This means that farmers will be able to obtain all the fertilizer, pesticides, machinery, and feed that they can profitably use.

It was assumed further that (6) the pattern and level of crop production in 1950 is adjusted to what would have prevailed in 1950 assuming normal weather and production rates; (7) the maximum potential increases in crop and pasture yields and production per animal were those that might be achieved with full adoption of the known crop and livestock improvement practices (including improvements in land uses) that could be carried out profitably by the better farmers. (8) The 1955 projections of the levels and patterns of crop and livestock production that could be attained are those that would result from the acreage of land that could be expected to be utilized, if educational and other programs were intensified, if farmers adopted the profitable systems of farming best suited to their resources, and if they improved their production practices to the extent that would be attainable by that time. It is further assumed that 1955 projected levels of production are those which could be maintained indefinitely except as qualified in the section "Shifts in Land Use" (beginning page 7).

The assumption regarding normal weather in 1950 (number 6) was not used by the California Committee. This committee felt that it was not feasible to make such adjustments in 1950 data for this state. The bulk of California agriculture is irrigated and, while it is recognized that unusual weather conditions affected the level of production of some few crops, it was thought that little was to be gained by attempting to completely revise the basic estimates for 1950 of the Crop and Livestock Reporting Service. Appropriate attention has been given this point concerning particular crops when projecting attainable yields for 1955.

It is obvious in the above statement that the word "profitable" is of dominant importance and is closely associated with prices. It became necessary, therefore, to give particular attention to the prices used in evaluating

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8/ These data include workers under fourteen years of age as well as part-time workers--hence, they differ from the census data shown in the table.

TABLE 1

Selected National Economic Measures and California Farm Prices;
1947-1950, 1949, 1950, and Projected for 1955[a/]

Item	Unit	1947-1950 average	1949	1950	Projected 1955
National economic measure:					
Population	millions	148.8	150.1	152.6	162
Labor force[b/]	millions	63.1	63.6	64.6	69
Unemployment	millions	2.6	3.4	3.1	2
Military force	millions	1.4	1.5	1.5	3.5
Civilian employment	millions	59.1	58.7	60.0	63.5
Nonagricultural	millions	51.1	50.7	52.5	56.5
Agricultural	millions	8.0	8.0	7.5	7.0
Gross national product	billion dollars	257.0	255.6	279.8	375
Consumer expenditures	billion dollars	178.2	178.8	190.8	235
Gross private domestic investment	billion dollars	38.9	33.0	49.4	52
Net foreign investment	billion dollars	2.2	.4	- 2.5	3
Government expenditures for goods and service	billion dollars	37.6	43.3	42.1	85
Personal disposable income	billion dollars	187.0	187.4	202.7	252
Consumers' price index	1935-1939=100	168.4	170.2	171.9	190
Wholesale prices, all commodities	1926=100	158.4	155.0	161.5	185
Prices received by farmers	1910-1914=100	266	249	256	300
Prices paid, interest, taxes and wage rates	1910-1914=100	251	250	255	287
Wage rates	1910-1914=100	429	428	425	525

(Continued on next page.)

Table 1 continued.

Item	Unit	1947-1950 average	1949	1950	Projected 1955
Prices paid for commodities used in production	1910-1914=100	240	238	246	270
Fertilizer	1910-1914=100	144	150	144	165
Machinery	1910-1914=100	248	270c/	275	285
Farm motor vehicles	1910-1914=100	298	320c/	320	340
Parity ratio	1910-1914=100	106	100	100	105
California Farm Products:					
Cotton	cents per pound	34	28	44	38
Barley	dollars per hundredweight	2.63	2.33	2.29	2.93
Lambs	dollars per hundredweight	23.02	23.60	25.30	28.39
Eggs	cents per dozen	50	51	42	52

a/ The data shown above for 1955 should not be considered as forecasts but only as projections for use in appraising agricultural productive capacity for 1955. The precise levels indicated in the tables are not as significant as are the basic underlying assumptions that farm prices will be relatively favorable in a prolonged period of high-level defense activity.

b/ The labor force as defined excludes workers under fourteen years of age.

c/ Preliminary from Agricultural Prices, October, 1950.

Source: U. S. Bureau of Agricultural Economics, Income, Price, and Cost Assumptions for Appraisal of Agricultural Productive Capacity, 1955, June, 1951. Background data based on reports of the Bureau of Agricultural Economics, Bureau of Labor Statistics, and the Department of Commerce (Bureau of the Census and Bureau of Foreign and Domestic Commerce).

the "profitability" concept. It was recognized that, if the maximum level of production is to be feasible, it must also be profitable and requires a high level of management. The criterion of profitability was that the better farmers would find the practices profitable. This hypothetical agricultural norm, therefore, becomes the criterion or yardstick to measure the attainable.

The three "ifs" in assumption 8 above are highly important. The attainable could not reasonably be expected to equal the maximum but, and this was quite important in the work of the committee, the attainable does represent a higher level of productivity than may be expected by 1955 from the usual sequence of events, the three "ifs" not being considered.

Price Relationships

Projected prices for 1952 and 1955 were used to indicate the relative profitability of the various crop and livestock products. These prices were prepared from information supplied by the National Joint Committee and are consistent with the framework of assumptions. The Bureau of Agricultural Economics had prepared a schedule of projected United States farm prices for 1955 which were available to the California Committee. Those data included the percentage change of the projected 1955 prices from 1950 by individual products. The actual calculation of projected California farm prices involved one change from the method used by the Bureau of Agricultural Economics.

The California Committee first calculated at the United States level the percentage change of 1955 projected prices from the 1947-1950 average. These ratios were then applied to the 1947-1950 average of California prices--to project 1955 state average prices for California products. The broader base of four years, 1947-1950, was believed to provide a more stable and reliable basis for the price projection. Typical 1955 projected prices and the basic data for selected commodities are shown (Table 1).

Data for all other important California products also were available to the Committee.

The assumed 1955 price relationships represent certain changes from 1951 and other recent years--changes that are important in the projections of attainable acreage and yields. The position of cotton may be used as an example. The state average price in 1950 was 44 cents per pound, the same as the preliminary estimate for 1951. This price compares with 34 cents, the average for 1947-1950, and a projected price of 38 cents for 1955. It seems evident that this projected 1955 price will not represent as sharp a competitive advantage for cotton, in comparison with alternative crops, as it enjoyed in 1950 and 1951. The projected 1955 prices of feed grains and alfalfa hay both show important price increases in contrast with the projected decline for cotton prices. In livestock the major shift in 1955 price relationships is that prices of beef cattle and lambs will be lower relative to hogs than in 1950 or 1951. The prices of chickens, turkeys, eggs, and milk will continue to be relatively favorable.

Other Relationships

PROJECTED SHIFTS IN LAND USE AND CROPS, 1950-1955[2/]

The total land area of California includes slightly more than 100 million acres of which 35½ million are in farms (Table 2). No changes in farm acreage are projected between 1950 and 1955, but important shifts are projected from noncropland to cropland, and, within the latter category, from close-growing to intertilled crops, and from summer fallow or idle into crop uses. These shifts, reported on a state-wide basis, were prepared without benefit of the agricultural census data for 1950. The acreage in various categories may require adjustment when 1950 census data are available. The direction of the projected shifts, however, is considered accurate. The preliminary analysis of acreage shifts was made by areas based on crop reporting districts slightly modified in accordance with land use capability (Figure 1).

Shifts in Land Use

The attainable level of land use for 1955 must be viewed in relation to changes that occurred from 1950 to 1951. The most important single shift in those years was 31 per cent increase (582,000 acres) in the intertilled crops (Table 2). That expansion was accomplished by an increase estimated at nearly 200,000 acres (2 per cent) in the total land in crops and decreases of 284,000 acres (7 per cent) in close-growing crops, and of 107,000 acres (5 per cent) in hay and pasture crops. The expansion of total land in crops was made possible by reducing summer fallow 164,000 acres (13 per cent) and by bringing into cropland use some 44,000 acres (2 per cent) of former noncropland.

Such a large change in major land use between two consecutive seasons occurs only in response to unusual stimuli and inevitably creates serious problems of readjustment throughout agriculture. This is true in California. The stimuli were related primarily to cotton--particularly the enforced acreage limitation by the 1950 allotment program. The normal reaction of farmers was to expand acreage in 1951 when there were no controls to which was added a positive reinforcing encouragement--the sharp price increase for the crop of 1950.

Some of the results of the increased cotton acreage in 1951 appear quite evident. An important fraction was expanded onto land not best suited to cotton. Some growers not fully experienced with the crop or improperly

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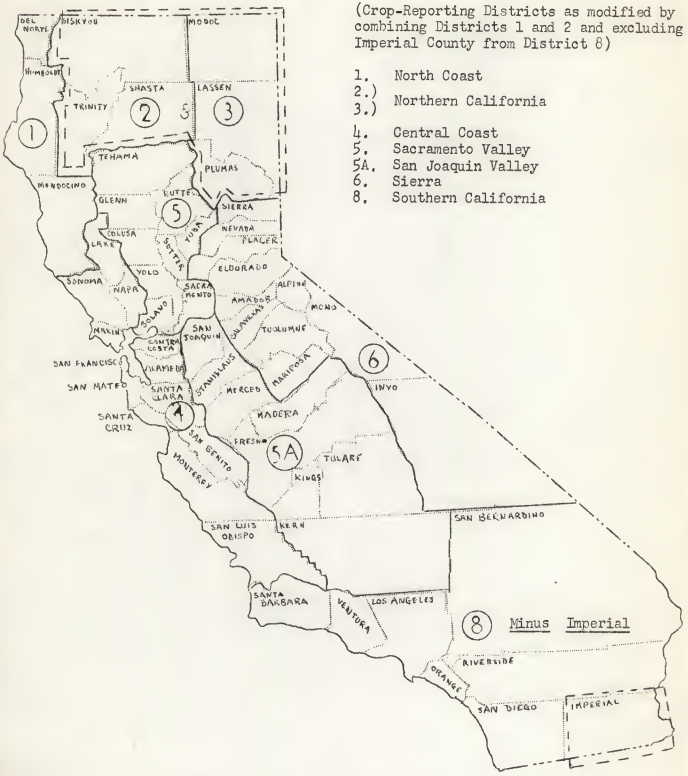
2/ The Crop Production Subcommittee was responsible for projections in this and following sections in Changes in Technology and Projected 1955 Crop Yields. This subcommittee functioned as three working subcommittees: Agronomic Crops, J. P. Conrad (Chairman) (also Chairman of Crop Production Subcommittee), L. M. Clarke, J. P. Moody, and L. R. Wohletz; Truck Crops Subcommittee, J. H. MacGillivray (Chairman), W. R. Schoonover, and J. E. Mullen; Fruit Crops Subcommittee, E. L. Proebsting (Chairman), H. D. Chapman, and H. P. Olmo.

Figure 1.-Areas Considered in Analyzing 1955 Attainable Agricultural Productive Capacity in California *



* Sources: California Crop and Livestock Reporting Service; U.S. Soil Conservation Service.

TABLE 2

Major Acreage and Percentage Changes in California Farm Land Use; 1950-1951, and 1950, 1951 to Projected 1955 Attainable[a]/

	Acreage			Shifts in acreage			Percentage change		
	1950	1951	1955	1950-1951	1950-1955	1951-1955	1950-1951	1950-1955	1951-1955
	1,000 acres								
Intertilled	1,875	2,457	2,394	+582	+519	- 62	+31.0	+27.7	- 2.5
Close growing	3,903	3,619	3,777	-284	-126	+158	- 7.3	- 3.2	+ 4.4
Hay and pasture	2,024	1,917	2,245	-107	+221	+328	- 5.3	+10.9	+17.1
Fruits and nuts	1,495	1,503	1,534	+ 8	+ 38	+ 31	+ 0.5	+ 2.6	+ 2.1
Total cropped	9,297	9,496	9,950	+199	+653	+454	+ 2.1	+ 7.0	+ 4.8
Summer fallow	1,227	1,063	960	-164	-267	-103	-13.3	-21.8	- 9.7
Total cropland	10,524	10,559	10,910	+ 35	+386	+351	+ 0.3	+ 3.7	+ 3.3
Noncropped hay and pasture	18,677	18,686	18,690	+ 9	+ 13	+ 4	+ 0.1	+ 0.1	+ 0.0
Woodland	4,000	4,000	4,000	--	--	--	--	--	--
Other	2,299	2,255	1,900	- 44	-399	-355	- 1.9	-17.4	-15.7
Total	35,500	35,500	35,500	--	--	--	--	--	--

a/ The committee estimates on major land use categories are based on 1945 Census data and various analyses of this information. The 1950 Agricultural Census for California was not available at the time the report was prepared. Crop and Livestock Reporting Service acreage data were available for crops, and the land use capability data of the Soil Conservation Service were used in preparing state balances of farm land by uses. It is recognized, however, that the estimates of summer fallow, total cropland, and "other" land are subject to considerable error, particularly as to the year in which "other" land was converted to cropland through new development and improvement.

equipped for optimum production got into cotton. And, finally, cotton acreage tended to expand to the limit of available water supply. That is significant because all California cotton is irrigated and on many farms must compete with other crops for part of the water used.

Feed grain and alfalfa were the largest contributors of acreage for the cotton expansion. But a reduction in grains and alfalfa is contrary to an expansion in California livestock. And an expansion of livestock, particularly in beef cattle and sheep, is considered economically sound. Such expansion will bring an increased demand for grain, hay, and other feed crops so essential to livestock production. It may be concluded, therefore, that the major shifts from cereal and hay crops to row crops (largely cotton) that occurred between 1950 and 1951 have set the stage for rather extensive readjustments in California agriculture.

The acreage shifts projected between 1950 and 1955 reflect increased intensity and more complete use of farm land resources in California. It is expected that the total amount of cropland will increase by 3 per cent, or from 10.5 to 10.9 million acres, and that this shift will be at the expense of the category "other crops" which is indicated to decline 16 per cent, or 355,000 acres. This shift will result from bringing into cultivation land formerly in noncrop uses. It means extensive land improvement and an expansion of irrigation facilities. Well irrigation largely will supply the additional water needed. The committee considered that the projected ditch water projects will not progress far enough by 1955 to be a major factor.

The inadequacy of major land use data was a vexing problem in this study. Land improvement has proceeded at a rapid rate in the San Joaquin Valley and in other areas. It is recognized that the estimated acreage of "total cropland" probably does not include all such newly developed land brought into crop uses since 1945. It seemed reasonable to the committee, however, to expect a total cropland acreage of 10.9 million by 1955. It is not important in this projection whether the 10.5 million acres estimated for 1950 is too low. If so, it merely means that a greater proportion of the 1955 attainable already has been accomplished.

The other major increase in land use intensity by 1955 is a reduction of nearly 22 per cent, or 267,000 acres, in summer fallow. The net result of adding new land and reducing summer fallow is to increase the land in crops by 650,000 acres, or 7 per cent, between 1950 and 1955. The net result of these changes in over-all land use would be to bring the acreage of close-growing (largely cereal) crops and hay and pasture closer to 1950 levels without drastically reducing the acreage of intertilled crops. Further attention will be given to the relationship among individual crops in the following sections.

It is important at this point to recognize that cropland expansion in the western San Joaquin Valley is being accomplished at a very considerable financial outlay, largely for providing irrigation water. A high gross income per acre, such as that from cotton at recent prices and yields, is essential to justify such investments. Not enough information is available to evaluate how long available ground water supplies will make farming possible under present technology and prices. It is still less possible to

project the rate of withdrawal of land in this area from intensive crop production if physical or economic conditions later dictate such withdrawals. Certainly, much more ditch water will be required to irrigate all land now irrigated. Proportionately more will be needed as additional land development occurs. It may be concluded, therefore, that the attainable pattern of land use in California for 1955 cannot be construed as a permanent, long-term level. Additional water-supplying facilities will be needed to maintain the projected irrigated acreage.

Shifts in Acreage Between Crops

Before analyzing the acreage shifts among individual crops, it is useful to place them in major groups. It is also instructive to study the shifts in these groups from 1950 to 1951 because those shifts are highly important in interpreting the 1955 attainable acreage of various crops. For this analysis, crops were considered in four major groups: (a) raw material, seed, and food crops, (b) feed grains, (c) hay and pasture, and (d) vegetables, fruits, and other specialty crops (Table 3).

Analysis shows that between 1950 and 1951 the acreage of raw material, seed, and food crops increased 800,000, or 44 per cent. Feed grains decreased 421,000 acres, or 14 per cent. And, hay and pasture crops decreased 107,000 acres, or 5 per cent. The sharp increase in raw material, seed, and food crops, at the expense of both feed grains and hay and pasture, suggests the necessity for readjustments in all three groups. Those readjustments, as reflected in the projected 1955 acreages, are: a cutback of 150,700 acres (6 per cent) in raw material, seed, and food crops; an increase of 269,000 acres (11 per cent) in feed grains; and an increase of 328,000 acres (17 per cent) in hay and pasture.

The projected 1955 attainable acreages of these major groups of crops, as compared to 1950 levels, are : 645,076 more acres (36 per cent) of raw material, seed, and food crops; 152,000 fewer acres (5 per cent) of grains; and 221,000 more acres (11 per cent) of hay and pasture. These bulk shifts are discussed in more detail by major groups and by individual crops in succeeding paragraphs.

Raw Material, Seed, and Food Crops

This group was further subdivided into those crops that increased and those that decreased in acreage between 1950 and 1951 (Table 3).

Crops that increased in acreage between 1950 and 1951 included cotton, rice, processing tomatoes, dry beans, flaxseed, castor beans, and ladino seed. These crops as a group increased 953,000 acres, or 72 per cent, between those years. Cotton contributed three-fourths of that increase.

Cotton expanded from 586,000 to 1,340,700 acres, or almost 130 per cent, which is particularly significant because all of it had to come on irrigated land. Cotton occupied in 1951 more than one-fifth of all irrigated land

TABLE 3

Major Acreage and Percentage Changes in California Crop Acreage; 1950-1951, and 1950, 1951 to Projected 1955 Attainable

Raw materials, seed, and food crops	Acreage			Shifts in acreage			Percentage change		
	1950	1951	1955	1950-1951	1950-1955	1951-1955	1950-1951	1950-1955	1951-1955
	1,000 acres								
Increases, 1950-1951									
Cotton	586	1,341	1,250	+755	+664	- 91	+128.8	+113.3	- 6.8
Rice	240	319	250	+ 79	+ 10	- 69	+ 32.9	+ 4.2	-21.6
Tomatoes (process)	76	145	120	+ 69	+ 44	- 25	+ 92.0	+ 58.9	-17.2
Beans, dry	319	339	320	+ 20	+ 1	- 19	+ 6.3	+ 0.3	- 5.6
Flaxseed	60	662	60	+ 2	--	- 2	+ 3.3	--	- 3.2
Castor bean	2	20	20	+ 18	+ 18	--	+733.3	+733.0	--
Ladino seed	35	45	55	+ 10	+ 20	+ 10	+ 28.6	+ 57.1	+22.2
Total	1,318	2,271	2,075	+953	+757	-196	+ 72.3	+ 57.4	- 8.6
Decreases, 1950-1951									
Sugar beets	218	149	175	- 69	- 43	+ 26	- 31.6	- 19.7	+17.4
Potatoes	123	84	90	- 39	- 33	+ 6	- 31.7	- 26.8	+ 7.1
Alfalfa seed	115	77	90	- 38	- 25	+ 13	- 33.0	- 21.7	+16.9
Safflower	27	16	16	- 11	- 11	--	- 59.3	- 59.3	--
Total	483	326	371	-157	-112	+ 45	- 32.5	- 23.2	+13.8
Net total	1,801	2,597	2,446	+796	+645	-151	+ 44.2	+ 35.8	- 5.8

(Continued on next page.)

Table 3 continued.

Feed grains	Acreage			Shifts in acreage			Percentage change		
	1950	1951	1955	1950-1951	1950-1955	1951-1955	1950-1951	1950-1955	1951-1955
	1,000 acres								
Increases or constant, 1950-1951									
Wheat	710	710	710	--	--	--	--	--	--
Decreases, 1950-1951									
Corn (grain)	42	32	35	- 10	- 7	+ 3	- 23.8	- 16.7	+ 9.4
Grain sorghums	136	101	110	- 35	- 26	+ 9	- 25.7	- 19.1	+ 8.9
Oats (grain)	196	163	169	- 33	- 27	+ 6	- 16.8	- 13.8	+ 3.7
Barley (grain)	1,800	1.494	1,730	-306	- 70	+236	- 17.0	- 3.9	+15.8
Grain, hay	733	696	711	- 37	- 22	+ 15	- 5.0	- 3.0	+ 2.2
Total	2,907	2,486	2,755	-421	-152	+269	- 14.5	- 5.2	+10.8
Net total	3,617	3,196	3,465	-421	-152	+269	- 11.6	- 4.2	+ 8.4

(Continued on next page.)

Table 3 continued.

Hay and pasture	Acreage			Shifts in acreage			Percentage change		
	1950	1951	1955	1950-1951	1950-1955	1951-1955	1950-1951	1950-1955	1951-1955
	1,000 acres								
Increases or constant, 1950-1951									
Irrigated pasture	682	702	800	+ 20	+118	+ 98	+ 2.9	+ 17.3	+ 14.0
Sudan	125	125	135	--	+ 10	+ 10	--	+ 8.0	+ 8.0
Other hay	159	159	160	--	+ 1	+ 1	--	+ 0.6	+ 0.6
Total	966	986	1,095	+ 20	+129	+109	+ 2.1	+ 13.4	+ 11.0
Decreases, 1950-1951									
Alfalfa hay	1,058	931	1,150	-127	+ 92	+219	-12.0	+ 8.7	+ 23.5
Net total	2,024	1,917	2,245	-107	+221	+328	- 5.3	+ 10.9	+ 17.1
Vegetables, fruits, and other specialty									
Fruits	1,495	1,503	1,534	+ 8	+ 38	+ 31	+ 0.5	+ 2.6	+ 2.1
Vegetables	613	668	654	+ 54	+ 41	- 14	+ 8.9	+ 6.6	- 2.0
Total	2,108	2,171	2,188	+ 62	+ 79	+ 17	+ 2.9	+ 3.8	+ .8
Miscellaneous intertilled	138	105	106	- 33	- 32	+ 1	-23.8	- 23.1	+ 1.0
Net total	2,246	2,276	2,294	+ 29	+ 47	+ 18	+ 1.3	+ 2.1	+ .8

Source: Appendix Tables 1 to 3.

available for field crops in California.10/ Furthermore, the additional 754,700 acres of cotton had to come out of other crops or land uses.

It is recognized that the 586,000 acres of cotton in 1950 had reflected an enforced reduction of some 400,000 acres from the 1949 level due to PMA allotments. But, the facts that cotton sold for 40 cents or more per pound during much of the fall of 1950 and that acreage allotments were removed are important in explaining the sharp increase in cotton acreage in 1951. Much of the cotton acreage added between 1950 and 1951 was taken from barley (and other cereals), alfalfa, and summer fallow.

It was already noted that cotton had expanded in 1951 on some lands not best suited to cotton and that irrigation water threatens to be a limiting factor in some areas. A significant point should be added regarding the complementary relationships between cotton and barley in the use of water. Barley is grown as an irrigated winter crop in the west side of the San Joaquin Valley. It is irrigated from the same pumps that irrigate cotton in the summer. Actually, the irrigation seasons of the two crops somewhat overlap. Since barley uses less water, the optimum acreage of barley is two to three times that of cotton. But, in 1951 some growers reduced their barley acreage below the optimum in the attempt to direct more water to cotton. Cotton acreage can be expanded temporarily in this way, at the expense of barley, but it is believe the associated drain on underground water cannot be maintained permanently. Thus, farmers have departed temporarily from rotations and production policies that will have to be re-established in considerable measure.

The attainable acreage of cotton in 1955 is projected at 1¼ million acres which is a cutback of 91,000 acres from the 1-1/3 million in 1951.

Rice also gained in acreage between the 1950 and 1951 seasons. The increase of 33 per cent was partly a reaction to 1950 acreage allotments and partly due to unfavorable weather during the winter and spring months of 1950-51 which prevented rice farmers from planting normal acreages of barley, wheat, and other grains. Farmers tended, therefore, to plant more rice than previously planned. And, the 1951 acreage was overexpanded both in terms of normal market outlets and in terms of sound farming practice. It was in excess of that permitting optimum practices according to current technical knowledge. Because the lands used for rice have limited alternative uses, the normal management practice is to rest it on a reasonably regular schedule in order to control weeds and to insure sound soil management. The adjustment deemed necessary is reflected in the projected 1955 acreage of 250,000. That represents a considerably greater reduction from 1951, percentagewise, than that for cotton.

Canning tomato acreage expanded from 75,524 acres in 1950 to 145,000 in 1951. That expansion reflected a combination of a relatively favorable, competitive price situation plus farmer reaction to an unfavorable 1950 sugar

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10/ There are some 6.5 to 7.0 million acres of irrigated land in the state, of which about 2 million acres are in fruit and vegetables.

beet harvesting season. (For a sizable acreage of beets in the Sacramento Valley, wet weather delayed harvest until well into the spring of 1951.) The overexpanded acreage of tomatoes in 1951 was accompanied by record yields which resulted in the largest production on record. The attainable acreage in 1955, under our price assumptions, is considered to be 120,000 acres, a cutback of 25,000 acres, or 17 per cent, from 1951. The reduction, incidentally, is approximately equal to the projected increase in sugar beets (noted later).

Acreage of dry edible beans expanded from 319,000 acres in 1950 to 339,000 in 1951 partly due to peculiar seasonal conditions in which some beans were planted on acreage that otherwise would have been in sugar beets or rice. The projected 1955 acreage of dry beans, 320,000, represents a cutback of 19,000 acres from 1951.

Acreage of ladino harvested for seed increased from 35,000 to 45,000 between 1950 and 1951. Ladino seed is a specialty crop relatively localized in the state. The seed is in demand for seeding irrigated pastures. This crop has been increasingly profitable as a result of two major technological improvements--using honey bees for improved pollinization and more effective harvesting equipment. Further expansion in production is expected, and the 1955 acreage is projected at 55,000.

A promotional campaign led to an increase in castor beans from 2,400 acres in 1950 to 20,000 in 1951. Not much is generally known about this crop, but the possibilities from what is known are rather intriguing. One problem has been to find a satisfactory method of harvest. The development of new, lower growing varieties that facilitate harvest would encourage additional acreage. The uses for castor beans include medicinal, in plastics, as lubricants, and others. Agronomic research workers believe that new findings may improve the competitive position and that, under emergency conditions, additional production could be stimulated effectively. However, the prospective future market for castor beans is still somewhat problematical. Lacking more precise information, the committee projected 1955 acreage at the 1951 level.

Summing up, the projected 1955 acreage of this group of crops (that showed increases between 1950 and 1951) is 757,076 acres (57 per cent) above 1950, but it is 195,700 acres (9 per cent) below 1951. About 160,000 acres of that cutback would be in cotton and rice (Table 3).

Crops that decreased in acreage between 1950 and 1951 included sugar beets, potatoes, alfalfa seed, and safflower. These crops had decreases totaling 150,700 acres, or 44 per cent, between those years.

Sugar beet acreage declined about 32 per cent from a record 218,000 acres in 1950 to 149,000 in 1951. That reduction, as previously noted, was partly due to unfavorable weather conditions during the 1950 harvest. The acreage of 1951 is considered too low from the standpoint of good farming practices and optimum use of resources of beet producers. However, the competitive situation of sugar beets under the projected 1955 conditions does not favor recovery of the record 1950 acreage. The 1955 acreage is projected at 175,000.

Acreage in potatoes also declined about 32 per cent from 123,000 in 1950 to 84,000 in 1951. That reduction resulted primarily because 1950 production exceeded market demand at satisfactory prices. The rather definite removal of the possibilities of government price support and allotment programs probably was another contributing factor. The acreage projected for 1955, 90,000, is 7 per cent above 1951, but it is 27 per cent below 1950.

Alfalfa acreage harvested for seed was reduced from 115,000 to 77,000 between 1950 and 1951 largely due to special conditions of weather affecting seed development and harvest in 1951. The attainable acreage in 1955 is set at 90,000 acres, or 13,000 larger than in 1951, but it represents a reduction from 1950. The alfalfa seed industry in California is shifting from production of common to certified seed. Production also is becoming more specialized inasmuch as the certified tends to be grown on special acreage not regularly used also for early season cuttings of hay.

Safflower is another crop relatively new to California. It received considerable promotional effort in both 1950 and 1951. Some of the 27,000 acres planted in 1950 resulted from growers seeking crops to replace cotton (limited by the allotment program). The 1951 acreage of safflower was cut back sharply to 16,000 partly because 1950 yields did not reach the expectations of some growers and partly due to a return to cotton in 1951. Improved varieties and more knowledge of cultural requirements suggest a definite place for safflower in certain areas of the state. That is especially true if the current high demand for cotton should weaken and growers have to plant less cotton. It is quite possible that further research developments in safflower will improve its competitive position and thus encourage a substantially larger acreage. Lacking more definite information, the committee projected the 1955 acreage at 16,000, same as in 1951.

Summarizing, the projected total acreage of this group of crops (that decreased in acreage between 1950 and 1951) is 45,000 acres more than in 1951, but it is 112,000 acres less than in 1950. The 1955 total of 371,000 acres is about 14 per cent below the 1950 figure of 483,000 acres (Table 3).

Feed Grains

Feed grains, as defined here, include barley, wheat, oats, corn, grain sorghums, and grain hay. Wheat is included because much of that grown in California is used as feed. Feed grains in the state are predominantly cereal crops grown during the winter and spring months with or without irrigation. Wheat is grown on unirrigated land to a larger degree than barley. Grain sorghums and corn are summer, irrigated crops and, as such, compete for land with cotton.

Feed grains, as a group, decreased in acreage from 2,907,000 in 1950 to 2,486,000 in 1951. The reduction of some 400,000 odd acres represented a decline of 14 per cent (Table 3). The 1955 projected attainable acreage of feed grains represents a readjustment from 1951 but not back to the 1950 levels. The projected acreage for the group is 2,755,000 which is 269,000 acres (11 per cent) more than in 1951 but 152,000 acres (5 per cent) less than in 1950.

Considering our production resources, there is practically an unlimited market for California-produced feed grains. This situation results from a projected increase in production of livestock and livestock products needed by a sharply increasing West Coast population. Regardless of the demand situation, however, there are other crops that will pay more for the use of land than cereals where adequate water is available. It is not expected, therefore, that the cereal crops will re-establish their 1950 acreages under the assumptions projected for 1955. It is considered more economical and more profitable for California farmers to maximize their acreage of the high value crops and to ship in a large proportion of the grain and concentrates required to feed their livestock. The situation for individual grain crops is outlined in succeeding paragraphs.

Wheat was the only feed grain that did not lose acreage between 1950 and 1951--the acreage was 710,000 in both years. No change is projected for the 1955 attainable.

Barley was responsible for a large part (306,000 acres) of the reduction in feed grains between 1950 and 1951. Barley was cut back 17 per cent. The projected 1955 acreage of 1,730,000 represents a readjustment above 1951 of 236,000 acres but still 70,000 acres below 1950.

Oats (harvested for grain) were also cut back 17 per cent in 1951 from the previous year. The projected 1955 acreage (169,000) is only 4 per cent above 1951 and 14 per cent below 1950.

Grain sorghums were reduced to 101,000 acres in 1951 from 136,000 in 1950. This crop lost acreage to cotton and other summer irrigated crops. Since grain sorghum is an important ingredient of commercial mixed feeds which will be in strong demand under the assumed conditions, the acreage of this crop is expected to recover although not to the 1950 level. The projected 1955 acreage is 110,000, or 9 per cent above 1951, but 19 per cent below 1950.

Corn, harvested as grain, reached 42,000 acres in 1950 when it was used to some extent as a substitute for cotton. But, in most cases, corn was a disappointing alternative and the acreage promptly declined to 32,000 acres in 1951 when farmers could again plant all the cotton they wanted. Interest in corn, as a feed crop in California, persistently reappears from time to time. That interest has stimulated research in irrigation methods, fertilization and other cultural practices, and new knowledge is being contributed. Nevertheless, farmers do not experience uniform success with corn. Yields are sometimes satisfactory and sometimes not. A continuing interest in corn production is expected on the part of hog producers who would use corn as a "hogged-off" crop. As an alternative to corn to be harvested as grain, grain sorghum appears to be a better alternative. Sorghum has a shorter growing season, takes less water, and is easily harvested with combine harvesters--a machine needed and used for other crops. In view of these considerations, the 1955 acreage of corn for grain was projected at 35,000 acres.

Grain hay acreage dropped from 733,000 acres in 1950 to 696,000 acres in 1951, a matter of 5 per cent. Some year-to-year variation in acreage occurs because, to some extent, grain is made into hay when the crop is too poor to harvest as grain. Generally speaking, however, the grain hay

acreage is relatively constant in the state. It was on that basis the committee projected the 1955 acreage at 711,000.

Hay and Pasture

Major crops in this group are alfalfa hay and irrigated pasture, chiefly ladino or trefoil alone or in combination with certain grasses. Irrigated pasture showed a 20,000-acre increase in 1951 as compared with 1950 (Table 3) which is approximately the 3 per cent annual increase that has characterized this crop for the last several years (Appendix Table 1). Alfalfa hay, on the other hand, decreased 12 per cent. The net shift for the two crops, therefore, was a decrease of 5 per cent. Most of the loss in alfalfa acreage was to cotton both in the San Joaquin Valley and in southern California.

Irrigated pasture has proven highly profitable in producing both milk and meat and represents an efficient use of land having a limited competitive advantage in harvested crop production. Farmers will find additional lands better suited to pasture than anything else. Alfalfa hay, on the other hand, is a harvested crop that must compete for land with cotton and other crops. However, alfalfa hay need not fear competition from hay produced in other states. The bulk and consequent cost of hauling demand that most of it be produced within the state. Of course, small inshipments of alfalfa, about equivalent to the volume dehydrated, are received from Arizona and Nevada and will probably continue in about that volume. But, most of the increased hay requirements needed for increased livestock production must be produced here.

The projected 1955 attainable acreage of both alfalfa and irrigated pasture is sharply above both 1950 and 1951. The same is true of the minor pasture and hay crops that remained constant between 1950 and 1951. It is considered that 1,095,000 acres of irrigated pasture, sudan, and minor tame hay crops are attainable in 1955. That would be 11 per cent over 1951 and 13 per cent over 1950. Alfalfa hay is projected to reach 1,150,000 acres in 1955, or 24 per cent above 1951 acreage and 9 per cent above 1950. These projected shifts in hay and pasture are consistent with those projected for livestock.

Vegetables, Fruits, Other Miscellaneous Specialty Crops

Vegetables and fruits are of dominant importance in California cash farm income. Vegetables and other specialty crops together occupied about 3/4 million acres out of a total of 2¼ million acres of intertilled crops in 1950, and the proportion as projected for 1955 is in a similar ratio (Table 3). Bearing fruit acreage occupied an additional 1½ million acres of land in both 1950 and 1951, and little change is projected for 1955. Since practically all the vegetables and more than 75 per cent of the fruit are irrigated, the importance of these specialty crops is obvious; the two types of production combined utilize 2¼ million acres, or almost 30 per cent, of all irrigated land. Vegetable acreage trends will be discussed first inasmuch as one item, processing tomatoes, already has been considered under field crops.

Total vegetable acreage increased 9 per cent from 1950 to 1951 (Appendix Table 2). This net figure resulted from a 70,000-acre increase in processing tomatoes accompanied by reductions of less scope in asparagus, carrots, lettuce, and miscellaneous other vegetables. The projected acreage of all

[illegible] to [illegible] in the [illegible]. It was an [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

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vegetables for 1955 is 2 per cent less than 1951. The reduction mainly represents a readjustment in canning tomatoes amounting to 25,000 acres. Little basis seems to exist for anticipating any substantial change from 1951 levels in the projected acreage of most other vegetables. A dominant fact in the production and marketing situation is that the existing acreage of most vegetables could supply larger quantities than the market now takes. In other words, the harvested yields are less than production. Growers frequently do not harvest the entire crop because the market will not take the entire production at prices satisfactory to the grower. It was considered, therefore, that any increase in demand associated with our assumptions for 1955 could be met by the present acreage.

The total acreage of fruit shows little net change either between 1950 and 1951 or the projections for 1955 (Appendix Table 3). The bearing acreage amounts to about 1½ million in all three situations while an additional 127,000 to 128,000 acres are nonbearing. The bearing acreage increased less than 1 per cent from 1950 to 1951, and the projected acreage in 1955 would represent less than a 3 per cent increase over 1950--2 per cent over 1951.

In contrast to minor change in all fruit, some important shifts are indicated among individual fruits. Decreases are projected for apricots (3,000), figs (1,000), grapefruit (about 1,000), oranges (3,000), and prunes (5,000). Increases are expected for almonds and walnuts (each about 10,000), avocados (6,000), grapes (15,000), and peaches (4,000).

Technology of production offers little opportunity to increase fruit production sharply through incentives. However, fruits are like vegetables in that the actual volume harvested and marketed may be varied rather widely in any given season in response to market conditions. Also, a wide range of opportunities exists for changing the method of utilizing fruits--hence, vary the production of certain products under conditions of national emergency. Grapes are an outstanding example. The production of raisins can be expanded tremendously at the expense of table grapes and wine.

No attempt was made to prepare estimates of marketable yields and total production of either vegetables or fruits that could be obtained if conditions should require utilizing the maximum quantity of wholesome food from these sources. The question, however, deserves serious consideration when availability of productive resources in agriculture is being considered. Fruits and vegetables use over half of the fertilizer and comparable quantities of the pesticides in California. They also exert a tremendous demand on labor supplies in greater proportion than acreage. Moreover, fruits and vegetables, particularly in reeent years, have come to require specialized machinery such as blower-type sprayers, pruning rigs, and harvesting equipment. Much of this new machinery has been so recently developed or is in such a stage of evolution that the optimum technology has not yet been established. Success in establishing labor-saving and other improved practices depends upon availability of these machines and, in turn, upon the steel and other materials from which they are made.

Farm and Nonfarm Noncrop Grazing

Open permanent pasture occupies 18½ million acres of land in farms. An additional 3.3 million acres of farm woodland, out of a total of 4 million,

are used in grazing (Appendix Table 1). A certain amount of grazing also is available from other miscellaneous noncropland in farms. Grazing on crop aftermath and other residue from harvested crops, of course, constitutes an important segment of the total feed consumed by California livestock.

The 18½ million acres of noncrop permanent pasture include a wide variety of natural conditions and, hence, a considerable range in livestock carrying capacity. Moisture, generally speaking, is the factor limiting the amount and quality of grazing on this kind of land throughout California. A considerable proportion of it also has a cover, in varying density, of scrub brush and other undesirable wood or woody plant growths. Estimates vary as to the amount of grazing land thus affected, but the total may reach 12 to 14 million acres of which an appreciable fraction is included in the 18½ million acres of "open" permanent pasture in farms. There are other important problems in management besides limited precipitation and competition from brush and other undesirable plants, but these other problems will be considered later in the section on yields.

The approximately 65 million acres of land not in farms in California include, broadly speaking, three categories of which one is of interest to agriculture. This category, which includes roughly 22 million acres available for grazing, contains a wide variety of conditions. About 7.7 million acres are in national forest and another 1.4 million acres are in private land managed by the national forest. About 6.5 million acres are in privately owned range, and roughly 6.5 million acres are public domain type grazing. Most of this grazing land, except the 6.5 million acres of privately owned range not in farms, is under control of some public agency. Because these agencies, in general, have rather definite programs and policies covering utilization, it appears that farmers can do little to change the present level of production. Some of the grazing land having undesirable brush cover, not included in the 18½ million acres noncrop pasture in farms, is either privately owned range or publicly owned grazing land.

The committee could foresee no appreciable changes in acreage of open permanent pasture and range in farms or of nonfarm land used for grazing by 1955. Similarly, it could foresee no shifts in acreage between major categories (Appendix Table 1).

SHIFTS IN LAND USE AND MAJOR CROPS BY SUBAREAS 1950-51[11/]

The shifts between 1950 and 1951 in land use and between major crops have been discussed in some detail for the state as a whole. These shifts

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11/ Subareas were based on the Crop and Livestock Reporting Service reporting districts modified to agree in major principle with Land Use Capability Subareas of the Soil Conservation Service. The data used here for selected major crops are comparable to the estimates and projections for California as a whole presented in earlier sections. These data have not been adjusted according to the 1950 Census and, therefore, are subject to later revision. It is considered, however, that the general cropping pattern by subareas, the direction of change between seasons, and the over-all amount of change are indicated accurately by these unadjusted data.

were also tabulated by subareas to aid the analysis. The data show striking dissimilarities among the subareas.

To restate, the land area cropped by California farmers increased by 198,570 acres, or about 2 per cent, between 1950 and 1951. This was accomplished by an addition of about 35,000 acres of cropland and by a shift of 163,000 acres out of summer fallow (or idle) into crop use. These shifts have not been accurately identified by subareas, but shifts in acreages of selected major crops have been summarized by subareas (Table 4). This tabulation gives some indication of the changes in cropland in the subareas between 1950 and 1951.

The San Joaquin Valley, containing some 40 per cent of the cropland in California, showed the largest change between 1950 and 1951; the total acreage of major crops increased by 318,000 acres. That change resulted from an increase of 654,000 in raw material, seed, and food crops; a decrease of 321,000 in feed crops; and a decrease of 15,000 in specialty crops (vegetables and fruits). Most of the increase was in cotton (694,000) which increased from 583,000 acres in 1950 to 1,277,000 acres in 1951. That increase absorbed all available idle land and summer fallow, considerable newly developed irrigated land, and cut heavily into acres of other crops. In 1951, cotton occupied 32 per cent of all land in crops in the Valley.

Other much smaller increases occurred in processing tomatoes (21,000), dry beans, rice, and irrigated pasture. A large part of the decrease in feed crops came in barley (190,000) and alfalfa hay (85,000). Dry weather in the spring of 1951 cut into the acres harvested of dry land grains. Smaller decreases came in grain sorghum, grain hay, wheat, and truck crops.

Compared with the San Joaquin Valley, the changes in other subareas were relatively minor. Those subareas having increases in total acreage of major crops were northern California, Sacramento Valley, and Imperial County. Subareas having decreases were North Coast, Central Coast, and southern California (excluding Imperial County).

Northern California showed increases in barley, wheat, alfalfa hay, and irrigated pasture, and a decrease in potatoes.

The Sacramento Valley grows most of the rice, one-third of the sugar beets, one-third of the canning tomatoes, and important acreages of grain and forage crops. Between 1950 and 1951, the Sacramento Valley had increases in rice (75,000), tomatoes (29,000), dry beans, grain hay, and irrigated pasture. Decreases occurred in sugar beets (19,000), barley (67,000), wheat, and alfalfa hay (36,000).

Central Coast had small increases in acreages of tomatoes and wheat. It had small decreases in sugar beets, barley, grain hay, alfalfa hay, irrigated pasture, and truck crops.

Southern California (excluding Imperial County) had increased acreages of cotton (23,000), tomatoes (4,000), wheat, and truck crops, and had decreases in dry edible beans, sugar beets, barley, grain hay, and alfalfa hay.

TABLE 4

California Crop Acreages, 1950 and 1951, Selected Major Crops by Subareas[a/]

Class and crop, 1950	State totals[b/]	Subareas							
		1 North coast	2 and 3 Northern California	4 Central Coast	5 Sacramento Valley	5a San Joaquin Valley	6 Sierra	8 Southern California[c/]	Imperial County
	1,000 acres								
Raw materials and food crops									
Cotton	586	--	--	--	--	583	--	3	--
Rice	240	--	--	--	208	28	3	--	--
Tomatoes (process)	76	--	--	9	27	33	--	6	--
Beans	319	--	--	30	84	83	--	122	--
Sugar beets	218	--	--	47	76	44	--	18	33
Potatoes	123	1	10	4	--	88	--	19	--
Total	1,562	1	10	90	395	859	3	168	33
Feed crops									
Barley	1,800	3	112	188	552	751	10	158	27
Wheat	710	2	66	166	138	216	20	68	32
Grain sorghum	136	--	--	3	51	56	--	6	20
Grain hay	733	31	49	213	107	169	17	144	2
Total grain	3,379	36	227	570	848	1,192	47	376	81
Alfalfa hay	1,058	8	79	40	126	524	6	142	133
Irrigation pasture	682	8	43	32	190	347	22	39	1
Total hay and forage	1,740	16	122	72	316	871	28	181	134
Total feed crop	(5,119)	(52)	(349)	(642)	(1,164)	(2,063)	(75)	(557)	(215)
Specialty crops									
Truck crops (excluding tomato, processing)	538	--	--	183	16	168	--	102	69
Deciduous tree fruits	361	4	1	162	68	87	24	15	--
Citrus tree fruits	295	--	--	--	2	44	--	246	2
Other tree fruits	88	--	1	--	14	43	1	29	--

(Continued on next page.)

Table 4 continued.

Class and crop, 1950	State totals[b]	Subareas: 1 North coast	2 and 3 Northern California	4 Central Coast	5 Sacramento Valley	5a San Joaquin Valley	6 Sierra	8 Southern California[c]	Imperial County
		1,000 acres							
Specialty crops (continued)									
Nuts	244	--	--	61	70	62	2	48	--
Grapes	504	7	--	42	7	394	3	49	1
Total	2,030	11	2	448	177	798	30	489	72
Grand total	8,711	64	361	1,180	1,736	3,720	108	1,214	320
Class and crop, 1951									
Raw material and food crops									
Cotton	1,341	--	--	1	--	1,277	--	26	38
Rice	319	--	--	--	283	31	5	--	--
Tomatoes (process)	145	--	--	21	56	54	--	10	3
Beans (dry edible)	339	--	--	34	99	89	--	117	--
Sugar beets	149	--	--	34	57	10	--	14	34
Potatoes	84	--	8	4	--	52	--	18	--
Total	2,377	--	8	94	495	1,513	5	185	75
Feed crops									
Barley	1,494	2	124	165	485	561	10	119	27
Wheat	710	2	75	178	124	207	19	77	27
Grain sorghum	101	--	--	4	50	34	--	3	10
Grain hay	696	31	49	195	123	150	15	130	2
Total grains	3,001	35	248	542	782	952	44	329	66
Alfalfa hay	931	8	83	37	90	439	6	135	133
Irrigation pasture	702	8	45	30	203	351	23	41	1
Total hay and forage	1,633	16	128	67	293	790	29	176	134
Total feed crops	(4,634)	(51)	(376)	(609)	(1,075)	(1,742)	(73)	(505)	(200)

(Continued on next page.)

Table 4 continued.

Class and crop, 1951	State totals[b]	Subareas							
		1 North coast	2 and 3 Northern California	4 Central Coast	5 Sacramento Valley	5a San Joaquin Valley	6 Sierra	8 Southern California[c]	Imperial County
	1,000 acres								
Specialty crops									
Truck crops (excluding processing tomatoes)	523	--	--	179	15	153	--	106	70
Deciduous tree fruits									
Citrus tree fruits									
Other tree fruits	1,492	11	2	265	161	630	30	387	3
Nuts									
Grapes									
Total	2,015	11	2	444	176	783	30	493	73
Grand total	9,026	62	386	1,147	1,746	4,038	108	1,183	348

a/ See map, Figure 1, for boundaries of subareas.

b/ Failure to crossfoot due to rounding of figures.

c/ Excluding Imperial County.

Imperial County had increased acreages of cotton (38,000) and tomatoes and decreases in wheat and grain sorghum.

An upsurge of cotton production south of the Tehachapi is one outstanding fact emerging from the data. Cotton acreage expanded from almost nothing (3,000 acres in 1950) to 64,000 in 1951. And, further expansion can be expected as growers reportedly were well satisfied with 1951 results. Improved new varieties of cotton, more successful cultural practices, and successful mechanical harvest have made cotton a more favorable crop in these desert areas.

CHANGES IN TECHNOLOGY AND PROJECTED 1955 CROP YIELDS

California's productive capacity, projected to 1955, depends not only on maximum use of our land but also on the maximum feasible crop and pasture yields. The hope for attaining higher yields is found largely in improved practices stemming from new technology developed through research and in the wise application of those new practices by the greatest number of farmers.

Special technology research committees were appointed to assemble information regarding improved production practices attainable in 1955 for field crops, truck crops, and fruit crops. These special committees were under the general cognizance of subcommittees that also were members of the California State Committee on Survey of Agricultural Productive Capacity. This operating procedure insured that the particular researcher studying a particular crop also evaluated its present and potential technology. This portion of the analysis was made more difficult by two factors. First, any major shift in acreage of a particular crop means a partial shift to better or poorer land, and that limits the usefulness of comparing average yields in estimating the effects of new practices. Second, in surprising degree, the objective of much of the research in agriculture, as intensive and highly commercialized as in California, is to protect existing levels of production rather than increase yields per se. Thus, the objectives of research often are the development of disease-resistant varieties, the discovery of effective controls for insect pests, the improvement of marketability, or even facilitating the use of improved machinery rather than search for higher yielding varieties.

Projected 1955 attainable crop yields have more meaning when compared with current levels despite the limitations already noted. For comparison, the committee chose the year 1950 but adjusted the 1950 yields of those crops affected by abnormal weather. For example, the 1950 season was relatively favorable for cereal crops--thus, winter wheat yields were above average. Grapes suffered reduced yields due to unseasonable July heat. The adjusted 1950 yields for these and other crops are found in Tables 5, 6, 7, and 8.

Variation in acreage of a crop is an important factor affecting comparisons between projected and base yields. State average yields vary widely as the acreage of a crop expands onto poorer lands or contracts onto better lands. The projected 1955 yields allow for this factor as well as expected improvement in practices. Thus, the differences in projected and base yields are not wholly from changes in practices. In fact, with some crops, the

TABLE 5

Yield Comparisons for Selected California Crops, Estimates for the Base Period and 1950, and Projections for 1955 Attainable and Maximum

	Base period	Unit	Base period yield	1950 actual	1950 adjusted	1955 attainable	1955 increase over 1950 actual	1955 increase over 1950 adjusted	1955 Maximum
All upland cotton	1940-1949	pound	564.00	803.00	650.00	750.00	-53.00	100.00	800.00
Sugar beets	1940-1949	ton	15.20	17.90	17.90	19.60	1.70	1.70	22.00
Early potatoes	1945-1949	hundredweight	240.00	240.00	240.00	264.00	24.00	24.00	264.00
Alfalfa hay	1940-1949	ton	4.42	4.60	4.60	4.75	.15	.15	5.10
Alfalfa seed	1945-1949	pound	186.00	231.00	231.00	451.00	220.00	220.00	500.00
Ladino clover	1945-1949	pound	82.00	130.00	130.00	150.00	20.00	20.00	200.00
Irrigated pasture	1940-1949	AUM	6.00	8.00	8.00	9.00	1.00	1.00	11.00
Tomatoes (processing)	1948-1950	ton	12.30	12.70	12.70	12.90	.20	.20	14.00

Source: Estimates by Crop and Livestock Reporting Service; 1955 projections by California committee on basis of information supplied by technical committees.

TABLE 6

Crop and Pasture Yields Per Acre, Estimates for the Base Period and 1950, and Projections for 1955 Attainable and Maximum

Crop	Acreage	Unit	Base period	Yield per acre			
				Average for base period	1950 adjusted	1955 attainable	Maximum
Corn, all	planted	pound	1940-1949	1,814	1,904	2,100	--
All sorghums for grain	harvested	pound	1940-1949	2,061	2,184	2,100	--
All upland cotton	planted	pound	1940-1949	564	803	750	800
American-Egyptian cotton	planted	pound	1944-1949	121	168	--	--
Sugar beets	planted	ton	1940-1949	15.2	17.9	19.6	22.0
Irish potatoes	planted	pound	1945-1949	22,680	23,460	--	--
Early	planted	pound	1945-1949	24,000	24,000	26,400	26,400
Late	planted	pound	1945-1949	20,400	22,500	22,500	22,500
Beans, dry edible	planted	pound	1940-1949	1,294	1,421	1,500	--
Safflower	planted	pound	--	--	554	--	--
Castor bean	planted	pound	--	--	--	--	--
Stock beets		ton	--	20	20	20	20
Hops	planted	pound	1940-1949	1,490	1,715	1,600	--
Oats for grain	harvested	pound	1940-1949	941	1,024	941	--
Oats for hay	harvested	ton	--	--	--	--	--
Barley for grain	harvested	pound	1940-1949	1,363	1,536	1,536	--
Barley for hay	harvested	ton	--	--	--	--	--
Winter wheat	planted	pound	1940-1949	948	1,158	1,002	--
Flaxseed	planted	pound	1940-1949	1,025	1,322	1,450	--
Rice	planted	pound	1940-1949	2,927	3,240	3,450	3,600
Hay, grain	planted	ton	1940-1949	1.56	1.50	1.56	1.56
Hay, alfalfa	harvested	ton	1940-1949	4.42	4.60	4.75	5.10
Hay, other tame	harvested	ton	1940-1949	1.56	1.60	1.70	--
Hay, wild	harvested	ton	1940-1949	1.26	1.25	1.26	1.26

(Continued on next page.)

Table 6 continued.

Crop	Acreage	Unit	Base period	Yield per acre: Average for base period	Yield per acre: 1950 adjusted	Yield per acre: 1955 attainable	Yield per acre: Maximum
Seeds, hay and cover crop, all	harvested	pound	--	--	--	--	--
Alfalfa (clean)	harvested	pound	1949-1949	186	231	450	500
Ladino (clean)	harvested	pound	--	82	130	150	200
Pasture and range in farms							
Rotation (cropland) pasture		AUM			8.0	9.0	11.0
Ladino and other irrigated		AUM			8.0	9.0	11.0
Sudan pasture					4.3	4.3	4.3
Sugar beet tops					2.75	2.75	2.75
Hay land residue		AUM			1.39	1.39	1.39
Grain land residue		AUM			1.17	1.17	1.17
Open permanent pasture and range		AUM			0.55	0.60	0.75
Woodland pasture		AUM			0.10	0.10	0.15
Grazing land not in farms		AUM			0.176	0.176	a/
Private land					0.330	0.330	.500
National forest					0.067	0.059	.059
Public domain, district, Indian and state land					0.152	0.152	.152

a/ Not estimated.

Sources: Based on Form 3, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.

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[illegible]					[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

TABLE 7

Truck Crop Yields Per Acre, Estimates for the Base Period and 1950, and Projections for 1955 Attainable

Crop	Acreage	Unit	Base period	Yield per acre		
				Average for base period	1950 adjusted	1955 attainable
Asparagus	harvested	ton	1946-1950	1.23	1.24	1.32
Cantaloupe	harvested	Jumbo crate				
Spring (desert)	harvested	Jumbo crate	1948-1950	125	140	125
Midsummer	harvested	Jumbo crate	1948-1950	135	135	135
Honeydews	harvested	flat				
Spring	harvested	flat	--	--	--	--
Summer	harvested	flat	1948-1950	263	285	263
Carrots	harvested	crate (6 dozen)				
Winter	harvested	crate (6 dozen)	1946-1950	254	240	291
Spring	harvested	crate (6 dozen)	1948-1950	353	380	405
Fall	harvested	crate (6 dozen)	1948-1950	297	290	341
Celery	harvested	crate (16 inch)				
Winter	harvested	crate (16 inch)	1948-1950	653	740	666
Spring	harvested	crate (16 inch)	1948-1950	1,180	1,240	1,203
Summer	harvested	crate (16 inch)	1948-1950	880	1,040	897
Late fall	harvested	crate (16 inch)	1948-1950	503	580	513
Lettuce	harvested	crate (western)				
Spring	harvested	crate (western)	1946-1950	140	170	161
Winter	harvested	crate (western)	1946-1950	190	180	200
Summer	harvested	crate (western)	1946-1950	254	235	275
Fall	harvested	crate (western)	1948-1950	160	150	184
Tomatoes	harvested					
Processing	harvested	ton	1948-1950	12.3	12.7	12.9
Early spring	harvested	lug (32 pound)	1948-1950	330	440	347
Early summer	harvested	lug (32 pound)	1948-1950	362	330	400
Early fall	harvested	lug (32 pound)	1948-1950	358	380	376
All other vegetables	harvested	ton	1948-1950	4.60	4.70	4.69

Sources: Based on Form 3a, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.

TABLE 8

Fruit and Nut Yields Per Acre, Estimates for the Base Period and 1950, and Projections for 1955 Attainable

Crop	Acreage	Unit	Base period	Yield per acre		
				Average for base period	1950 adjusted	1955 attainable
Almonds	harvested	ton	1946-1949	.385	.413	.50
Apples--commercial companies	harvested	bushel	1946-1949	311	279	325
Apricots	harvested	ton	1946-1949	3.5	4.7	3.5
Avocados	harvested	ton	1946-1949	1.2	1.7	1.5
Cherries	harvested	ton	1946-1949	2.9	3.3	3.5
Figs	harvested	ton				
Fresh } from same acreage	harvested	ton	1946-1949	.41	.38	.40
Dried } from same acreage	harvested	ton (dry)	1946-1949	1.0	.8	1.0
Grapes	harvested	ton	1946-1949	5.7	5.0	5.7
Wine	harvested	ton	1946-1949	3.5	3.2	3.5
Table	harvested	ton	1946-1949	7.1	6.5	7.1
All raisin varieties						
Fresh basis	harvested	ton	1946-1949	6.7	5.7	6.7
Grapefruit	harvested	boxes	1946-1949	196	257 }	
Desert	harvested	boxes	1946-1949	238	360 }	215
Other	harvested	boxes	1946-1949	177	210 }	
Lemons	harvested	boxes	1946-1949	189	239	210
Oranges	harvested	boxes	1946-1949	191	214	205
Valencia	harvested	boxes	1946-1949	193	233	205
Navel	harvested	boxes	1946-1949	188	182	205
Olives	harvested	ton	1946-1949	1.8	1.6	2.0
Peaches	harvested	ton	1946-1949	9.4	9.3	10.3
Clingstone	harvested	ton	1946-1949	11.0	10.7	12.0
Freestone	harvested	ton	1946-1949	7.6	7.3	8.0

(Continued on next page.)

Table 8 continued.

Crop	Acreage	Unit	Base period	Yield per acre		
				Average for base period	1950 adjusted	1955 attainable
Pears	harvested	ton	1946-1949	7.6	8.6	8.3
Bartlett	harvested	ton	1946-1949	7.9	8.9	8.5
Other	harvested	ton	1946-1949	7.2	7.0	7.2
Plums	harvested	ton	1946-1949	3.4	3.3	3.5
Prunes	harvested	ton (dry)	1946-1949	1.5	1.4	1.7
Walnuts	harvested	ton	1946-1949	.59	.52	.65
Strawberries	harvested	tray (12 pints)	1948-1950	1,200	1,481	1,500

Sources: Based on Form 3b, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.

influence of improved practices is not enough to offset the influence of expansion onto poorer land. Thus, the projected yield of cotton, 750 pounds, is lower than the actual 1950 yield of 803 pounds obtained on a much smaller acreage.

The projected 1955 yields for a number of raw material, seed, and food crops show important increases over the adjusted 1950 level (Table 5). These projections for cotton, processing tomatoes, ladino seed, sugar beets, early potatoes, and alfalfa hay and seed are considered reasonable. For several crops, the stage average yield for at least one season has actually exceeded the 1955 projected attainable.

Research and technology for a number of field crops, including most of the cereals, dry edible beans, late potatoes, hops, flaxseed, and some minor hay crops, offer little promise of significantly higher yields in 1955 than in 1950. Some improvement is expected to result from normal improvement in general farming practices. However, no specific research knowledge, present or in prospect, seems likely to contribute important yield increases in the case of these crops.

The current situation and prospects for further increases in yields, either through more complete adoption of known practices or through research and development of new technology, is now discussed for selected crops individually.

Field Crops

Cereal Crops

Principal crops in this category are barley, wheat, and oats. A considerable fraction of the cereal acreage is nonirrigated, hence, vulnerable to variations in amount and timing of precipitation. As a result, cereal yields fluctuate more from year to year than the yields of many irrigated crops. For cereals, no new technology of a major yield-raising influence appears in sight. Some increase can be expected from a general improvement in farming practices. But, the 1955 projected yields do not represent major increases over the 1950 level (Table 6).

Cotton

Cotton yields have increased over the years and are expected to increase still further by 1955. The average yield during the ten-year period, 1940-1949, was 564 pounds of lint per acre. The adjusted 1950 yield was 650 pounds. (The 1950 yield actually averaged 803 pounds but on a much smaller acreage of better than average land.) The 1955 attainable yield, based on 1¼ million acres in cotton, was projected at 750 pounds. The particular technology expected to bring this improvement includes weed control, insect control, better crop rotations, use of wilt-resistant strains, and closer plant spacing.

Sugar Beets

An average yield of 19.6 tons per acre, representing an increase of 1.7 tons over 1950, is considered attainable in 1955. A number of improved practices are involved such as nitrogen fertilization, better irrigation, more

adequate plant populations, and better crop rotations to control insects and disease. The last-named practice would be facilitated by the projected decrease in beet acreage.

Early Potatoes

Improved techniques are already rather widely used in the production of potatoes. Thus, the projected increase in yield from 240 to 264 hundredweight per acre was associated very closely with a reduced acreage and use of better land for this crop. Some improvement in practices such as fertilization and greater use of certified seed were also considered important.

Alfalfa Hay

The state average yield has increased gradually over the years from improved general farming practices. The 1950 yield was 4.60 tons compared to a 1940-1949 average of 4.42 tons. A projected increase to 4.75 tons attainable in 1955 is expected to result largely from improved control of insects and other pests.

Alfalfa Seed

Yields of this crop have also increased from a 1945-1949 average of 186 pounds to a 1950 average of 231 pounds per acre. Some of the increase has resulted from better pollination due to heavier stocking with honey bees. Further advances in irrigation practice and methods of controlling harmful insects will be major factors in sharply increasing the state average yield to a projected 450 pounds in 1955.

Ladino Seed

Fertilization and improved harvesting methods that facilitate recovering more of the seed produced will be important in increasing state yields from 130 pounds in 1950 to 150 pounds in 1955.

Rice

The projected increase in yield of rice, 3,450 pounds in 1955 compared to 3,240 in 1950, seems reasonable in view of an indicated reduction in acreage which is basic to the policy of producers who would improve their management practices.

Dry Edible Beans

No appreciable increases are expected, but research in progress promises to improve market quality and to minimize problems in disease control.

Flaxseed

The state average yield of 1,322 pounds per acre in 1950 can be compared with 1,025 pounds in the 1940-1949 period. No further increase in yield is expected from present varietal work. Steps are being taken to breed fusarium wilt resistance into present varieties. The projected 1955 yield is 1,450 pounds per acre.

Water Treatment

Storage

Pumping

Water Mains

Fire Hydrants

Valves

Meters

Miscellaneous

Personnel

Corn

The 1950 yield (1,904 pounds) was slightly higher than the 1940-1949 average (1,814 pounds). The projected 1955 yield of 2,100 pounds mainly reflects an expected withdrawal of corn from less well-suited areas where it was tried in 1950 by farmers seeking a crop to replace cotton.

Castor Beans and Safflower

These new crops recently have expanded in California, but the acreage is relatively small and not yet stabilized. Although additional varietal work is needed, the experience of the last few seasons provides more knowledge about the adaptability of varieties than was known previously. In the judgment of researchers, additional information is needed concerning fertilization, proper irrigation techniques and adaptability to nonirrigated production in the Sacramento Valley. Such workers feel that yields of these crops quite likely will be increased but no attempt was made to evaluate the 1955 attainable yield for either. However, it is quite possible that important increases in both yields and acreage could be obtained by incentive measures in an emergency.

Vegetables

In discussing attainable acreage (in the preceding section), the point was made that a larger quantity of produce could be obtained from present plantings. It is a usual thing for some farmers to leave some fields, parts of fields, or a "final picking" untouched because the market just then will not take the additional quantities at satisfactory prices. That situation leaves little incentive for higher natural yields. The urge is often for improved quality, and much of the research has been in that direction rather than improving yields per se.

Among the vegetable crops, carrots are the most likely to show important increases in yield by 1955 (Table 7). Higher yields are expected from using pelleted seed, increasing plant populations per acre, and improving marketing techniques. The latter will make possible the harvesting and marketing of a larger proportion of the tonnage now produced.

Fruits and Nuts

Almonds, peaches, walnuts, and prunes are the crops appearing most likely to attain increased yields by 1955 (Table 8). The reason for better yields of almonds and walnuts is largely a matter of shifting acreage to more productive areas. That shift is now going on. The important factor for prunes will be pulling out marginal acreage and old orchards, thus, raising the average yield on the acreage retained.

Pasture and Range

Yields of pasture and range must be measured in some unit other than the bushels and tons used for harvested crops. Alternative measures sometimes used are (1) animal unit month of grazing, (2) gain in animal live weight, and (3) clipped sample areas of grass converted to dry forage (hay). None of these units are completely satisfactory for all purposes. Numbers (2) and (3) are

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sometimes preferred in experimentation. The difficulty with numbers (1) and (2) is that they measure utilization rather than yield unless rate of stocking is optimum and utilization is complete. However, the projections required in this study must assume considerable imperfection in stocking and utilization. The measure deemed most suitable here is animal unit month (AUM) defined as the amount of forage required to maintain a mature beef cow for thirty days. This unit is the one most commonly used in the range livestock industry. Grazing yields are to be discussed for irrigated pasture, crop residue pasture, dry land or permanent pasture, and range.

Irrigated Pasture

An increase by 1955 averaging one animal unit month per acre can be attained by applying improved practices already proven by research. This new level of production, 9.0 AUM compared to 8.0 in 1950, does not represent the maximum that eventually will be attained. The projected yield represents some increase in production of forage and some progress toward more complete utilization. However, great opportunities still remain both for improved cultural practices and for more optimum stocking with livestock to insure complete utilization of forage.

Crop Residue Pasture

Crop residue provides a considerable part of the total grazing available to California livestock. Crop residues, as defined here, include sugar beet tops, scattered grain and straw, late season crop regrowth, unmarketable refuse from fruits and vegetables, grass and other palatable weeds of any kind. In short, it includes all edible forage not harvested as a crop. The amount of grazing in AUM per acre on major kinds of crop residue is estimated at 2.75 for sugar beet tops, 1.39 for hay land, and 1.17 for grain land. Actually, no increases are expected in these yields which are figured on the basis of full utilization. But nowhere near all of the acres of such lands are grazed. More complete use of crop residue offers an opportunity for additional meat and wool production.

Dry Land Pasture and Range

Important yield increases are seen for dry land pasture and range in California by 1955. The carrying capacity of open permanent pasture and range in farms is anticipated to increase from .55 to .60 animal unit month per acre. This relatively small increase per acre is highly important as there are some 18½ million acres of this kind--about three times the irrigated crop acreage--in California. Research workers in range improvement are convinced that certain definite practices can be used to increase forage production. Such practices include rotation grazing, reseeding where necessary, use of fertilizers in some instances, and water development. Not all practices would be necessary or appropriate for any given situation.

Rotation grazing is the one most generally needed, promising the greatest improvement and having the broadest application. To accomplish optimum rotation grazing, however, would require considerable investment in fencing. A tremendous mileage of fence would be needed to establish rotation grazing on all promising sites. Any extensive reseeding program also would involve

considerable material and expense. Fertilizer experiments on pasture and ranges show mixed results. Although marked responses have resulted on some sites, little effect is observed on others. Nevertheless, researchers are encouraged to believe that fertilization promises to increase the grazing capacity considerably, considering the vast area of noncrop grazing land. But, more research is needed to determine the basis for most effective use of fertilizer.

Practices that appear most promising on woodland pasture are controlled brush burning, reseeding, rotation grazing, fertilization, and water development. Controlled burning, on land where brush or other undesirable woody plants now reduce carrying capacity, is considered a possibility in almost all parts of the state. The cost and returns of some practices have not, as yet, been worked out. Furthermore, questions of land control, availability of livestock, and the policies of agencies controlling public land have to be considered.

The committee considers the 1955 projected increase in carrying capacity of permanent pasture and range land is conservative. The potential capacity is far beyond its present production or that attainable in 1955. Progress toward realizing that potential should be stimulated by the anticipated expansion of grazing livestock. But, more information about the effectiveness and costs of proven methods of range improvement might hasten the time when potential yields of pasture and range are realized.

CHANGES IN RESOURCE REQUIREMENTS

The assumptions underlying this study specified ample supplies of all required materials and equipment, but labor was assumed to be in reduced supply in 1955 as compared with 1950. Considerable attention was devoted, therefore, to preparing approximations of what these assumptions might mean in terms of supplies, new equipment, and other resources needed in 1955. Only if materials are available in the quantities indicated do the attainable acres and yields for 1955 have meaning. Any special measures to increase the level of production for critical farm products above the levels indicated as attainable in 1955 necessarily, in most instances, would require still greater quantities of resources than those indicated.

Fertilizer Requirements

California farmers now use large quantities of fertilizer, but even larger quantities will be needed. In general, farmers now fertilize fruit and vegetable crops relatively more heavily than field crops, but the use on field crops is increasing. The amounts of fertilizer[12/] used on all crops in 1950 is estimated at 125 thousand tons of nitrogen (N), 60 thousand of phosphoric acid (P_2O_5), and 12 thousand tons of potash (K_2O) (Table 9). Thus, nitrogen is used in the greatest volume.

12/ In this section the quantities of fertilizer are shown in terms of the basic fertilizing constituent and not in terms of the materials as applied.

[illegible] capacity. Fertilizer requirements to achieve [illegible] of fertility.

[illegible]

[illegible] 1955 [illegible] potential yields [illegible].

[illegible]

[illegible]

Fertilizer Requirements

Although [illegible] large quantities of fertilizer, [illegible] 1955 [illegible]

12/ In this section the quantities of fertilizer [illegible]

TABLE 9

Fertilizer by Major Crop Groups; Estimated Use in 1950 and Projected Requirements in 1955 If Projected Acres and Yields of Crops Are Attained

Crop	Acres fertilized						Quantities used[a]					
	1950			1955			1950			1955		
	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)
	1,000 acres						tons					
Field crops	2,000	1,373	148.5	3,358	2,962	165.6	57,358	36,693	2,251	98,519	76,634	2,577
Truck crops	453.8	369.3	227.7	481.6	405.0	247.3	19,338	15,169	4,075	21,144	16,361	4,596
Fruits and nuts	814.9	244.0	156.4	881.0	259.3	164.4	48,957	8,005	5,890	52,322	8,514	6,206
Total	3,268.7	1,986.3	532.6	4,720.6	3,626.3	577.3	125.653	59,867	12,216	171,985	101,509	13,379

a/ Quantities shown are in terms of basic fertilizing constituents (N, P_2O_5, and K_2O) and not in terms of commercial materials as applied.

Sources: Estimates for 1950, official sources; projections for 1955, California committee.

Survey data indicate that approximately 3.3 million acres of California's 9.3 million acres of cropland received nitrogenous fertilizer in 1950 (Table 9). A more meaningful comparison is in terms of irrigated land. While no data are available to indicate exactly the amount of irrigated land that was fertilized, it is believed that approximately half of the 6.5 to 7.0 million acres of such land received nitrogenous fertilizer in 1950. And, by far the greater part of the nitrogen was applied on irrigated crops. Nitrogen was applied on about 815,000 acres of fruit crops, 454,000 acres of truck crops, and 2,000,000 acres of other crops. The last category (intertilled, close-grown, and hay and pasture crops) includes a total harvested acreage of about 7.6 million.13/

Among the field crops, cotton, barley, sugar beets, alfalfa hay, winter wheat, and potatoes, in that order, make up the bulk of the fertilized acreage. About 57,000 tons of nitrogen were used on field crops in 1950.

A large proportion of the truck crops was fertilized and, due to double cropping, a still greater proportion of the acreage planted received benefit from nitrogen applied during the 1950 crop year. Most of the vegetables, of course, are irrigated (Appendix Table 5). About 19,000 tons of nitrogen (N) were used on truck crops in 1950.

Among the fruit and nut crops there was considerable variation in the proportion of acreage fertilized with nitrogen (Appendix Table 6). The proportion was highest, for the most part, among those fruit crops that are largely irrigated. Almonds, grapes, and prunes occupy an important acreage, but the proportion fertilized was low compared to most other fruits. About 49,000 tons of nitrogen (N) were used on fruit crops in 1950.

Fewer acres, roughly two-thirds as many, are fertilized with phosphatic materials as with nitrogen. And yet, about 80 per cent of the truck, 33 per cent of the fruit and 67 per cent of the field crops received some phosphate. The total amount of phosphoric acid (P_2O_5) used in 1950 was 60,000 tons of which 15,000 tons were applied on truck crops, 8,000 on fruits, and 37,000 tons on field crops.

Only 12,000 tons of potash (K_2O) were used by California farmers in 1950. And fruit was the only crop where any sizable proportion (20 per cent) of the acreage received potash. Fruits got about one-half, truck crops one-third, and field crops one-sixth of the potash used.

If the acreage and yields of crops projected for 1955 are to be reached, total fertilizer requirements will be considerably larger than they were in 1950. The 1955 projections call for 46,000 tons more of nitrogen (N), 42,000 tons more of phosphoric acid (P_2O_5), and 1,163 tons more of potash (K_2O). The acreage fertilized with nitrogen would increase by 44 per cent, with phosphates by 82 per cent, and with potash by 8 per cent. It would mean a sharp expansion in the acreage of field crops to be fertilized and somewhat heavier applications on fruit and truck.

13/ Each acre producing one or more crops harvested in 1950.

Cotton and barley will account for most of the additional nitrogen used on field crops. The additional nitrogen for cotton alone is projected at 21,000 tons, an increase of 40 per cent over 1950 and representing half the additional nitrogen needed for all crops in the state. Most of the increase for cotton will be for additional acreage fertilized as the projected rate of application is only increased from 70 to 75 pounds of nitrogen (N) per acre (Appendix Table 4).

Field crops will also use most (40,000 tons) of the additional phosphoric acid (P_2O_5) required in 1955. The projections mean about 1,600,000 additional acres to be fertilized at the present rates.

Additional requirements for potash (K_2O) will be relatively small, amounting to only 1,136 more tons, with 25,000 more acres to be thus fertilized. Fruit crops will need about half the additional potash.

Research and Extension workers report a trend toward increasing use of fertilizer. This tendency well may be accentuated by the relatively favorable price relationships projected for 1955. Thus, the committee estimates of fertilizer requirements in 1955 could be too low.

Pesticide Requirements[14/]

Adequate supplies of pesticides, including fungicides, herbicides, and insecticides, were assumed when the committee prepared estimates of 1955 attainable acreage and yields. This will require sizable quantities of a wide range of materials. Estimates were prepared by the committee covering the use in 1951 and the 1955 attainable quantities (Table 10).

Special recognition should be given certain aspects of the problem in projecting pesticide requirements. The current estimates of quantities used are, at best, rough approximations of specific materials used on agricultural crops and livestock. There is no central source of data, a wide range of materials is commonly used for the same purpose, and there is considerable variation in both the form of a given chemical and the rate of application. Necessarily, the projected requirements for 1955 were guided to a considerable degree by technical information regarding what should be applied under California conditions. Nevertheless, the over-all data are considered a reliable indication of what materials are required in a typical year. It is emphasized that these figures relate only to agricultural uses.

The rapid rate of development in the pesticide field presents a special problem. It was assumed in this analysis that the same materials will be available in 1955 as in 1951. Solvents, carriers, and other types of adjuvants have not been considered. It was impossible, of course, to anticipate new materials, not now known, that may be discovered and become available in quantities by 1955. Such materials, however, merely would substitute for an appropriate quantity of one or more included in these projections.

14/ A special Pesticide Requirements Subcommittee was responsible for information in this section. E. G. Lindsley (Chairman) and C. E. Scott comprised this subcommittee.

TABLE 10

Farm Pesticides; Estimated Use in 1951[a] and Projected Requirements in 1955 If Projected Acres and Yield of Crops Are Attained

	1951		1955 attainable	
	Individual material	Total	Individual material	Total
	tons			
Fungicidal and insecticidal materials[b]				
DDT	3,243.5		3,182.7	
Methoxychlor	163.7		171.2	
DDD	1,641.8		1,577.6	
		5,059.0		4,931.5
BHC		167.2		163.0
Chlordane	67.9		76.8	
Toxaphene	154.2		155.7	
Aldrin	41.4		39.2	
Dieldrin	1.5		20.4	
		265.0		292.1
Parathion	368.5		740.0	
TEPP	82.8		87.4	
Other organic phosphates	2.5		75.0	
		453.8		902.4
Calcium arsenate	14.6		16.5	
Basic lead arsenate	465.3		492.3	
Standard lead arsenate	103.5		110.4	
Other arsenicals	11.3		11.8	
		594.7		631.0
Cryolite	440.9		373.4	
Other fluorine compounds	0.8		0.8	
		441.7		374.2
Rotenone	4.4		1.6	
Pyrethrins	0.5		0.5	
Nicotine	55.8		45.8	
		60.7		47.9

(Continued on next page.)

Table 10 continued.

	1951		1955 attainable	
	Individual material	Total	Individual material	Total
		tons		
Fungicidal and insecticidal materials[b/]				
Sulfur		27,263.9		26,014.4
Organic acaricides		3,538.6		3,555.8
Dinitros		135.5		138.8
HCN		125.0		25.0
Methyl bromide		30.0		30.0
Tartar emetic		3.0		2.5
Metaldehyde		0.75		0.75
Carbamates and other organic fungicides		157.9		158.0
Ceresan		131.2		123.8
N.I. ceresan		63.3		69.0
Metallic copper		952.6		952.6
PDB		2.4		2.5
Phenothiazine		20.4		22.3
		gallons		
Carbon bisulfide		300,000		300,000
D-D		73,620		75,000
EDB		21,150		22,000
CCl_4		20,000		20,000
Ethylene dichloride		60,000		60,000
Oil		4,525,600		4,028,100
Sabadilla		800		25,000
Lime sulfur		2,170,800		2,148,600
		tons		
Herbicidal materials				
Sodium chlorate		155.4		160.0
Borate-chlorate mixtures		46.1		50.0
Borax		9.4		9.5

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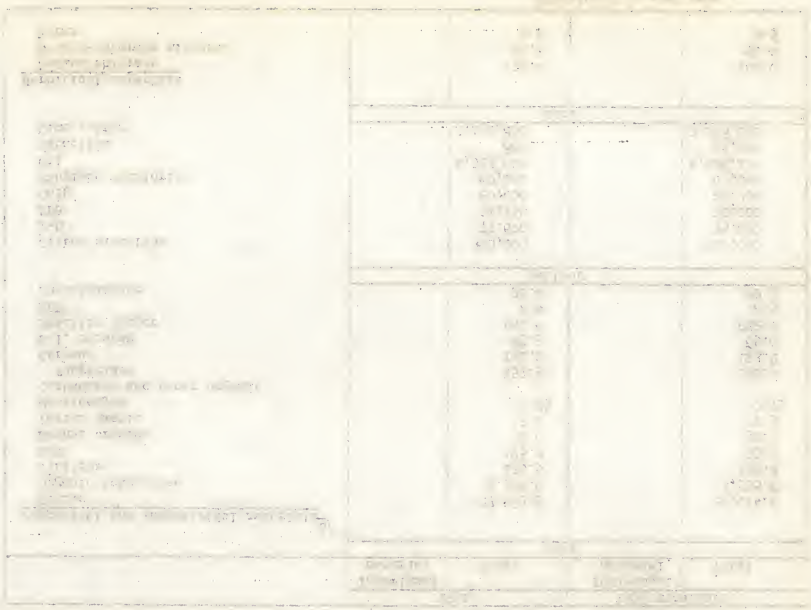

Table 10 continued.

	1951		1955 attainable	
	Individual material	Total	Individual material	Total
	tons			
Herbicidal materials				
Petroleum oils		1,467.2		1,800.0
2, 4-D acid		166.0		175.0
2, 4-D esters		6.8		7.5
2, 4-D salts		642.7		700.0
2, 4, 5-T		2.1		2.25

a/ Estimates were based on 1951 for convenience in assembling data from cooperating agencies.

b/ Proprietory names are used where no satisfactory chemical name is available.

The quantities, in all instances, are stated in tons or gallons of the pure or technical material. Copper compounds are listed as metallic copper, and BHC is based on the pure gamma isomar. Sulphur applies only to insecticidal and fungicidal use; soil sulphur is excluded.

The importance of adequate supplies of pesticide materials to the attainment of the 1955 projected farm production in California cannot be overstressed. Pesticides are essential to minimize the effects of plants diseases, insects, and weeds and thus permit maximum yields and high quality of crops. And, high yields and high gross dollar value per acre are mandatory if farming is to be profitable because costs of production are extremely high in California where the great bulk of the field, fruit, and truck crops are grown under irrigation. It is inconceivable that the 1955 attainable production could be accomplished in the absence of adequate quantities of these materials.

Machinery Requirements[15/]

The subcommittee that evaluated machinery use in 1950 and additional requirements projected in 1955 confined its attention to specialized machinery. The committee estimated the numbers of such machines that will be needed if the projected acreage and yield levels are to be reached in 1955.[16/] Specifically, the projections mean the number of machines in use that year. No attempt was made to estimate the numbers of replacement machines needed between 1950 and 1955.

Several important categories of improved machines must be increased in view of the assumed reduction in labor supply if the 1955 attainable volume of production is to be reached. Mechanical cotton pickers should increase by 5,000, nut harvesters by over 2,300, and pruning rigs by over 2,000 (Table 11). Pickup balers, bale loaders, and field forage harvesters are other important pieces of equipment that will be required in greater numbers.

Agricultural airplanes are one of the most vital items of equipment which will be needed in greater number. Thus, the projected 500 additional planes are considered highly important. In the past, adequate numbers of planes have been maintained through using surplus airplanes and parts made available by the Department of Defense. Such surplus materials rapidly are becoming exhausted and will soon be unavailable. The time has come when regular commercially built airplanes designed for agricultural use must take the place of the improvised planes built from surplus materials.

Another important item is supply of irrigation facilities. The importance of water development was mentioned in the discussion of new land development in the western San Joaquin Valley. The projected acreage in 1955 assumes

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15/ The Labor and Machinery Subcommittee was responsible for information in this section and the following section, Labor Requirements. Membership included J. P. Fairbank (Chairman), Roy Bainer, C. N. Johnston, Mrs. Margo W. Lenhart, Arthur Shultis, E. L. Haff, Jr. (Secretary), and M. Yudelman (Assistant Secretary).

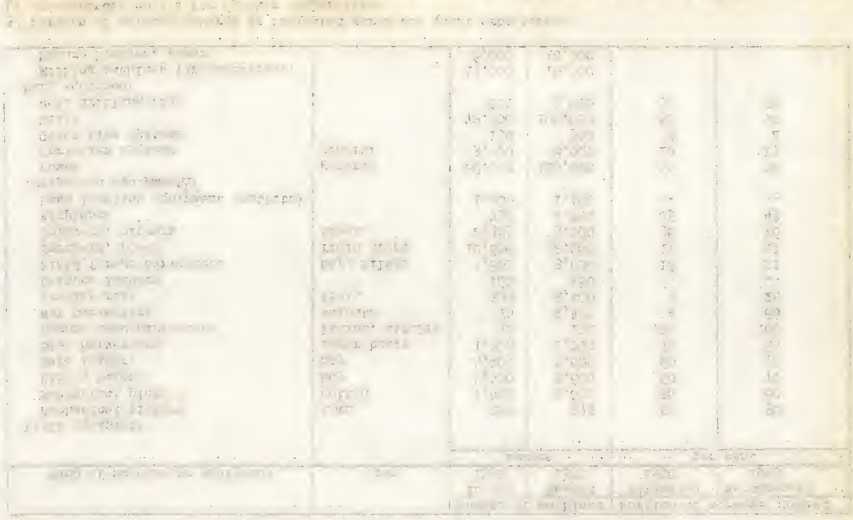
16/ See Appendix Note 1.

TABLE 11

Specialized Machines and Equipment; Estimated Use in 1950 and Projected Requirements in 1955 If Projected Acres and Yields of Crops Are Attained[a/]

Kind of machine or equipment	Crop	Number of machines		Portion of acreage covered	
		In use 1950	Needed 1955	Estimated 1950	Recommended 1955
		number		per cent	
Field equipment					
Mechanical pickers	corn	200	175	90	90
Mechanical pickers	cotton	1,400	6,600	26	80
Pickup balers	hay	4,400	5,600	60	70
Bale loaders	hay	4,400	5,600	60	70
Beet harvesters	sugar beets	1,200	1,200	70	85
Legume seed harvesters	ladino, alfalfa	70	110	100	100
Nut harvesters	walnuts	75	2,400	4	66
Pruning rigs	fruit	300	2,400	3	25
Lettuce loaders		160	180	--	--
Field forage harvesters	hay, silage	1,800	3,000	16	21
Sprayers, power	field crops	10,600	12,000	11	11
Sprayers, blowers	trees	2,385	3,000	36	46
Airplanes		750	1,250	25	43
Land leveling equipment (outfits)		1,000	1,100	--	--
Irrigation equipment[b/]					
Pumps	general	88,000	120,000	50	50
Sprinkler systems	general	3,500	8,000	10	15
Gated pipe systems		150	300	2	2
Wells		72,000	100,000	50	50
Well drilling rigs		600	1,000	50	50
Barn equipment					
Milking machines (installations)		17,000	18,000		
Manure loaders, power		8,000	10,000		

a/ Portion of acreage covered is irrigated acres not total crop acres.
b/ See Appendix Note 1 for further explanation.
Sources: California manufacturers and distributors, research and extension workers in the University of California, officials in the USDA, other federal agencies, and various California state departments.



that almost 400,000 additional acres of cropland will be developed as compared with 1950. The feasibility of maintaining the existing irrigated acreage and of developing the additional land depends in large degree on the continued availability of the irrigation equipment listed (Table 11).

Large numbers of other new machines covering the whole range of farm equipment will be required annually to maintain farm production in California at its 1951 level. Agriculture in this state is now almost completely mechanized so far as seedbed preparation, seeding, cultivation, and pest control are concerned. Tremendous strides also have been made in mechanizing the harvest. Harvest mechanization, in fact, is within sight for practically all field crops and many of the vegetables. Recent new developments in nut harvesters promise that these crops, too, soon will require greatly reduced amounts of hand labor. Such technological developments are vital under the conditions of short labor supplies assumed for 1955. By the same token, such a high level of technology makes agriculture extremely vulnerable to shortages of machines. A sustained supply of repair parts, above all, is extremely vital to our agriculture. It is only realistic to recognize that any shortage of necessary repair parts either in total or in point of time and place will, to that degree, reduce the possibility of attaining acreages and yields projected for 1955.

Labor Requirements

The opportunity to reduce labor requirements per acre and per unit of livestock between 1950 and 1955 must be considered in reference to the 1950 level of technology. Because California agriculture is already largely mechanized, we cannot expect any general, drastic reduction in labor required per unit of crops or livestock by 1955 (Appendix Table 7). Cotton is an outstanding exception in which 37 hours per acre (of which 33 are involved in harvest) are expected to be cut from 1950 average labor requirements. And, the importance of this crop in terms of acreage makes this reduction highly significant. Sugar beets is another crop with an important percentage reduction: 11 hours from the present 80 hours per acre. Most of the other reductions are small, though important in total, since it is assumed that less labor will be available. Among the truck crops, carrots, celery, and tomatoes (both processing and for fresh marketing) are expected to show reductions in labor requirements (Appendix Table 8). These crops require considerable hand labor and so a reduction is highly important. Almonds, apricots, peaches, and walnuts among the deciduous fruits, and lemons and oranges among the citrus, also are expected to show reductions in labor requirements per acre (Appendix Table 9). It may well be that the reduction indicated for almonds and walnuts is less than will be realized as the projected increase in mechanical nut harvesters should make possible even further reductions.

Reductions in labor requirements per beef breeding cow, dairy cow, lamb on feed, laying hen and broiler are expected. Although the amount of this reduction in labor per head seems small (except for dairy cows), it is important percentagewise amounting to 7 per cent for beef cows, 10 per cent for laying hens and broilers, and 33 per cent for lambs. The reduction of 5 hours of labor per dairy cow actually amounts to slightly less than 5 per cent (Appendix Table 10).

Labor Requirements

The opportunity to reduce labor requirements per acre and per unit of production is known. Like and 1952 must be considered as milestones in the trend of technology. Because California agriculture is already heavily mechanized, we cannot expect any gradual, drastic reduction in labor requirements such as came as labor was displaced by land (Appendix Table 1). Other is no comparable exception to which to look for 1975. A drop of 30 hours per acre (or about 33 per cent) between the CVA from 1950 average figure is conceivable, but the experience of this group in terms of actually making that reduction is not encouraging. Since there is another drop with an increased percentage reduction. It more than five percent of unit are. Most of the other reductions will be smaller. Among the larger ones, cotton, and perhaps [illegible] (depending on the final mechanizing) and tomatoes (depending on the degree of mechanization). Other crops, such as [illegible] (Appendix Table 8). Here crops requiring much hand work or a combination of family operation, diversified farms, and [illegible] are likely to show the greatest reductions in labor requirements per unit of production.

Reductions in labor requirements per head generally come, mainly from cows, laying hen and broiler are obvious. Although the amount of labor required in dairy per head seems small (except for dairy cows), it is important because [illegible] by 7 per cent for beef cows, 12 per cent for dairy heifers and replacements, and 22 per cent for dairy. The reduction of 3 hours per dairy cow is significant because [illegible] (Appendix Table 10).

CHANGES IN FEED SUPPLIES, 1950-1955

The importance of feed supplies to livestock production need not be elaborated. Suffice to say that more feed will be needed if more livestock and livestock products are to be produced. The available supply of feed grains, hay pasture, and range will be affected by the shifts in acreages and changes in yields projected for 1955. However, even those projections in land use and crops were conditioned by anticipated trends in livestock. This section sums up the effect of projected changes in crop production on feed supplies.

Feed Grains

California is a deficit area in feed grains despite its large production. Large quantities of grain must be shipped into the state from the Midwest and other surplus areas in order to support the livestock industry (Table 12). A large part of the inshipments is corn. The state harvested nearly 2 million tons of feed grains (including wheat) in 1950, from 2,748,000 acres planted (Appendix Table 12). The total production is divided approximately two-thirds barley, one-fifth wheat, and the remainder corn, oats, and grain sorghum combined. Despite an over-all deficit situation, large quantities of grain, particularly barley, are exported from California each year to Hawaii and other offshore points and some is shipped to other states. Thus, outshipments of barley in the 1950 crop year totaled nearly 600,000 tons. Net inshipments shown in Table 12 must be increased by this amount to equal total amounts shipped in. California food and industrial uses require some 650,000 tons of grain (about 400,000 of which is wheat) each year.

A unique characteristic of California agriculture is that much of the feed grain is produced as a cash crop, it is not fed on farms where produced. Therefore, most of it goes through market and trade channels. These market channels are well organized; hence, facilities are available for rapid changes in shipments of considerable magnitude either into or out of the state. Grain stocks on farms usually are relatively low and carry-over from one crop to another is mainly in mills, warehouses, and terminal elevators. A further consequence of this situation is that stocks in all positions fluctuate relatively less throughout the year than in some other areas of the country. Carry-over of old grain, therefore, bears relatively little relationship to total available supply during the ensuing crop year.

Net supply of specified grains, as estimated in this study, represents production less seed required for planting the following crop (Table 12). Thus, supply was not adjusted for differences in carry-in or carry-out for reasons already stated. The figure for corn is based on acreage harvested for grain; it excludes any grain contained in silage and reported elsewhere. The figure for wheat also represents total production less seed and is not limited to amount "fed on farms where grown" or "produced and fed in the state." The total supply of feed grains (including wheat) of 1,965,284 tons in the 1950 feeding season represents the net supply available from the 1950 crop for all purposes after correcting for planting seed requirement. The amount available for feeding livestock and outshipments, after subtracting 648,000 tons for food and industrial uses, was 1,317,284 tons. This was

Conclusion

Bibliography

TABLE 12

Feed Supplies Available to Feed Livestock and for Other Purposes; Estimates for 1950 and Projected as Attainable in 1955

Item	Year beginning October 1	
	1950-51	1955 attainable
	tons	
California-produced feed grains		
Corn, net supply[a]	39,704	36,430
Sorghums for grain, net supply[b]	148,008	114,950
Oats, net supply[a]	87,552	66,187
Barley, net supply[a]	1,311,840	1,251,395
Wheat, net supply[b]	378,180	323,050
Total net supply[c]	1,965,284	1,792,012
Total needed for food and industrial use	648,000	648,000
Total available for feeding livestock and outshipments	1,317,284	1,144,012
Total needed for feeding livestock[d]	2,063,400	2,295,500
Total available for outshipments	--	--
Total inshipments needed[e]	746,116	1,151,488
Other California farm-produced concentrates		
Cottonseed fed	2,000	2,000
Skim milk fed (dry basis)	10	10
California-produced hay		
Alfalfa hay, net supply[f]	4,802,000	5,462,500
Grain hay, net supply[f]	1,099,500	1,109,160
Other	475,650	511,400
Tame and wild hay, net supply[f]	6,377,150	7,083,060
Total needed for feeding livestock[d]	6,438,000	7,048,000
Total needed for milling mixed feed	140,000	150,000
Available for outshipments	--	--
Inshipments needed[e]	200,850	114,940
Other California roughages produced and fed		
Corn silage	528,000	577,500
Pea and bean straw silage	10,000	10,000
Stock beets, pumpkin	100,000	120,000
	animal unit months	
Carrying capacity of pastures and ranges		
Rotation (cropland) pasture (irrigated)	5,456,000	7,200,000
Open permanent pasture and range in farms (nontillable)	10,175,000	11,100,000
Sudan grass pasture (rotation)	537,500	580,500
Summer fallow and other idle farm land	565,000	465,000
Woods pastured	330,000	330,000
Sugar beet tops	229,900	313,250
Grain (winter and aftermath)	2,026,660	2,100,000
Hay residue (excluding grain hay)	883,582	900,000

(Continued on next page.)

Table 12

[illegible]

Item	[illegible]	[illegible]
[illegible]		
[illegible]		
[illegible]		

Table 12 continued

Item	Year beginning October 1	
	1950-51	1955 attainable
	animal unit months	
Carrying capacity of pastures and ranges		
Miscellaneous other field and vegetable crops	395,640	450,000
Orchard cover crops	90,431	90,500
Grazing land not in farms, state and Indian	141,600	141,600
Private land not in national forest	2,000,000	2,000,000
Private land in national forest	115,705	115,705
National forest	514,000	450,000
Public domain and grazing district	843,341	843,341
Total carrying capacity	24,304,359	27,079,896
Total requirements for livestock d/	22,942,000	26,379,000
Margin of surplus	1,362,359	700,896

a/ Production (harvested for grain acreage times yield per harvested acre) less seed.

b/ Production (harvested acreage times yield per harvested acre) less seed.

c/ Available for feeding livestock, food, industrial use, and outshipments.

d/ See Appendix Tables 11 and 12, column 7, line 14, for feed grains; column 10, line 14, for hay; and column 11, line 14, for pasture and range.

e/ For feeding livestock, carry-over at the end of the year, and for food and industrial uses within the state (not considering, for example, outshipments; 592,000 tons barley in 1950).

f/ Production less carry-out.

Sources: Estimates for 1950-51, Bureau of Agricultural Economics; projections for 1955 attainable, California committee.

Note: For the 1955 attainable, the carry-in and carry-out of feeds may be assumed to be equal.

Table 2. [illegible]

Item	[illegible]	[illegible]
	[illegible]	
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

some 746,116 tons short of the 2,063,400 tons needed for livestock in the 1950-51 feed year.17/ The item "Inshipments needed" represents net inshipments, or the margin of inshipments over outshipments. Actual inshipments probably amounted to 1.5 million tons and outshipments amounted to about 650-750 thousand tons considering barley exports.

The 1955 attainable production of feed grains (including wheat) in California is projected at 1,792,012 tons, about 9 per cent below the 1950 season. The amount available for livestock is estimated at 1,144,012 tons, or 14 per cent below 1950. (Food and industrial uses are estimated at the same level as in 1950.) In contrast, the feed grain requirement for livestock in 1955 is projected at 2,295,800 tons, an increase of 11 per cent over the amount required in 1950. Thus, even larger total net inshipments are needed for the 1955 projected levels of livestock production. The amount needed is about 1,151,788 tons which represents an increase of 405,672 tons, or 54 per cent over 1950.

There are two reasons for a smaller aggregate 1955 attainable production of feed grains than in 1950. First, the 1950 production itself was unusually high because yields were well above average. Second, grain acreage will be reduced in 1955 largely as a result of expanded cotton acreage. The increase in supply of feed grains needed for livestock in 1955 results primarily from additional numbers of feed lot cattle (1,000,000 compared to 650,000) and more chickens, broilers, and turkeys. A minor increase also is expected from an increase in the number and rate of feeding of milk cows.

The committee could not agree with recent BAE estimates of cottonseed fed whole on farms. The BAE figure for 1950 was 49,000 tons, or 10 per cent of total production. California cotton growers do not have enough livestock to feed that much cottonseed. Moreover, because they do not plant their own seed, they have no occasion to haul cottonseed back to their farms from the gin. Finally, they do not have storage facilities for bulk cottonseed. Consequently, the committee estimated that no more than 2,000 tons of cottonseed are fed on farms.

Hay

California is also a deficit hay-producing state though to a much less degree than in feed grains. Hay production and needs would nearly balance were it not for the alfalfa milled commercially. California's inshipments of alfalfa come largely from the Salt River Valley (Arizona) and small amounts from Nevada and Colorado. At times, California ships out hay to other states; hay was shipped to New Mexico and west Texas in the spring of 1951. The item "Inshipment needed" represents net inshipment--that is, the excess of inshipments above outshipments (Table 12).

The amount of hay production attainable in 1955 was projected at 7,083,000 tons, up some 11 per cent above 1950. The amount needed by livestock in 1955 would also be up 11 per cent. Thus, production increases would be in the same ratio as requirements. Net inshipments of about 115 thousand tons would be required in the projected 1955 situation.

17/ The livestock feed year is considered to begin about October 1.

Pastures

About three-fifths of all animal unit months (AUM) of grazing in California are on permanent pasture or range land and the other two-fifths are on cropland used exclusively for pasture or from crop residue (Table 12). The distribution of all grazing in 1950 and in the projected 1955 attainable situation is estimated as follows:

	All grazing	
	1950	1955 attainable
	per cent	
Rotation cropland pasture (irrigated)	22.4	26.5
Other grazing on cropland	19.4	18.0
Total on crop area	41.8	44.5
Open permanent and woods pasture and range in farms	43.3	42.2
Total on land in farms	85.1	86.7
Private land not in farms	8.7	7.8
Public land	6.2	5.5
Total on land not in farms	14.9	13.3
Total, all grazing	100.0	100.0

Although the grazing on public lands is a small percentage of the total, it nevertheless is important to ranchers in certain areas of the state. It provides grazing at a season of the year when some of the privately owned range is unproductive.

The expansion of irrigated pasture to about 702,000 acres, nearly all between 1935 and 1951, has been the outstanding development in the livestock grazing picture. Such pastures now provide almost one-quarter of all grazing in California. From this expansion of irrigated pasture, the proportion of grazing on the cropland area has increased to almost one-half of the total grazing.

The estimates of grazing AUM as reported here are in terms of usage rather than availability except for open permanent pasture and range in farms. The figures for permanent pasture and range represent estimates of availability. It is assumed that a high percentage of the available irrigated and sudan grass pasture is used, but this is not true of certain other categories. Not all of the available crop residue is utilized, mainly because owners of the potential pasturage do not have livestock. In some cases, no use can be made of crop residues because the land must be prepared for the next crop or because unfavorable weather follows closely on the harvest.

It is estimated that but half the potential grazing on grain land is utilized; however, it would not be feasible to use the whole potential. Likewise, only about 40 per cent of the sugar beet tops are pastured or otherwise used for feed.

The estimated total grazing capacity in 1950 was 24.3 million AUM compared with 22.9 million required by livestock. The margin of capacity over use, as estimated, amounted to about 6 per cent.

The carrying capacity projected for 1955 is 27.1 million AUM compared with the 26.4 million that would be required by livestock (Table 12). The 1955 attainable assumes a larger acreage of rotation (irrigated) pasture and higher production per acre--9.0 AUM compared with 8.0 AUM in 1950. The higher rate per acre is partly from increased yields and partly from fuller utilization, both resulting from better production and management practices. The increase in carrying capacity from sudan pasture is from an increase in acreage, and that from beet tops is from more complete utilization. The expansion of irrigated pasture itself in valley areas makes feasible a greater use of sugar beet tops. The slight increase in carrying capacity of grain stubble assumes no material improvement in utilization.

The estimates for open permanent pasture and range in farms calls for further comment. California has about 18.5 million acres of this kind of land. The state average yield in 1950 was estimated at .55 AUM per acre, and the projected 1955 attainable yield is .60 AUM. This increase is conservative compared to the ultimate potential based on range research. Research has demonstrated that rotation grazing would increase production of range forage on grassland by 25 per cent over much of the state. Range reseeding would be effective on a more limited area, but increases of 25 to 50 per cent could be expected where applicable. Stock water development would increase utilization by 5 per cent throughout the state. Controlled burning of brush and shrubs would materially increase the grazing capacity of certain lands. There is evidence that some of the range, in the northern and north coast areas where low rainfall is not a limiting factor, would respond to fertilization. (Fertilizer requirements discussed elsewhere in this report do not include range use--hence, any fertilization of range would increase the 1955 fertilizer requirements.)

It would be difficult to attain the full potential in range production. Rotation grazing on the range land in farms would require an estimated 2,000 miles of stock fence to be financed and built. Rotation grazing in many cases would also require developing additional stock water facilities and more ranch labor. All other range improvement practices would require time and labor for planning and adoption. The aggregate increase in production from partial adoption of these practices is projected at about 8 per cent by 1955.

Although public range lands in many cases also would respond to the improved practices discussed, the committee did not assume any substantial adoption of such practices by 1955. Even if the carrying capacity of public range land were increased materially, it would add only a minor amount to the state's aggregate carrying capacity.

Full utilization of grazing also becomes more difficult to attain as the maximum is approached. Pasturage must be used in place whereas hay and grain can be brought to the livestock. It probably never will be economical to attain full utilization of foothill spring and fall range, or of grain residue, because of the difficulty of timing. On the other hand, cattle and sheep are somewhat more mobile now as a result of ready truck transportation. The

livestock can move from place to place to utilize sizable amounts of seasonal grazing. Livestock men, however, must learn where the pasturage is located, and, once a seasonal pattern has been established geographically, feed and livestock can be coordinated more readily.

CHANGES IN PRODUCTION OF LIVESTOCK AND LIVESTOCK PRODUCTS[18/]

The most dominant factor affecting California's livestock and poultry industry during the past decade has been increasing demand, this being associated with a tremendous population gain of over 53 per cent. California has been for many years a deficit production area for the major livestock products except market milk. The deficit is growing wider so that, in 1950, production related to total slaughter amounted to but 53 per cent for cattle and calves, 58 per cent for sheep and lambs, and 37 per cent for hogs. The state also is deficient in eggs, chicken meat, cheese, and certain other dairy products. This pronounced shortage relative to requirements has been a strong factor tending to create a favorable position for the livestock and poultry industries. A partially offsetting factor has been the relatively high prices of feed grains. Large inshipments of feed grains, with attendant transportation costs, tend to keep prices relatively high.

California's meat supply comes from four sources: (1) meat animals produced in basic herds on farms and ranges within the state, (2) the gain in weight made on imported feeder animals, (3) inshipments of live animals for immediate slaughter, and (4) inshipments of dressed carcasses. Other states supply receipts in (3) and (4) and contribute the feeder frames for (2). During recent years, California's own production has increased materially in cattle and calves, decreased considerably in sheep and lambs, remained about level in hog production, and increased sharply in both chicken and turkey production.

Beef Cattle

Net production of cattle and calves has increased steadily since 1940 despite a decline in numbers of native beef cattle during the years 1944 to 1950 (Table 13). Beef production on California range had approached a maximum in the early 1940's. Much of the range, in fact, was overstocked during 1943 and 1944 which explains the later decline in range cattle numbers. Beef production not only has been maintained but has increased due to an upward trend of inshipments of stockers and feeders and a steady expansion in dairy cattle. (About one-fifth of California's beef production is from dairy herds.) Expansion in feeder cattle has been based to some extent on dry lot feeding but to a greater degree on irrigated pasture feeding. The three-fold increase in irrigated pasture acreage was noted in an earlier section.

The expansion of irrigated pasture has permitted an increase in production of grass fat cattle which find a ready demand in West Coast markets. The

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18/ The Livestock Subcommittee was responsible for the information in this section and the following section, Changes in Technology of Livestock Production. Members were J. F. Wilson (Chairman), V. S. Asmundson, G. E. Gordon, and G. M. Tucker.

[illegible] move from place to place to meet the [illegible] requirements. Livestock [illegible], however, [illegible] where the shortage is [illegible], [illegible] pattern has been established [illegible], [illegible] much more rapidly.

CHANGES IN PRODUCTION OF LIVESTOCK AND LIVESTOCK PRODUCTS[10]

The most dominant trend affecting California's livestock and poultry industry during the last decade has been increasing demand, this being associated with a tremendous population gain of over 50 per cent. California has been for many years a deficit production area for the major livestock products except market milk. The deficit is growing since in [illegible], production related to total consumption amounted to only 65 per cent for cattle and calves, 58 per cent for sheep and lambs, and 27 per cent for hogs. The state also is deficient in eggs, chicken meat, cheese, and certain other dairy products. This pronounced shortage relative to requirements has been a strong factor tending to create a favorable position for the livestock and poultry industries. A partially offsetting factor has been the relatively high prices of feed grains. Large shipments of feed grains, with attendant transportation costs, tend to keep prices relatively high.

California's meat supply comes from four sources: (1) meat animals produced on range lands and ranges within the state, (2) the movement of meats as imports from other states, (3) shipments of live animals for immediate slaughter, and (4) shipments of feeder animals [illegible]. Other states supply both (2) and (3) and (4) [illegible]. During recent years, California's own production has increased markedly in cattle and calves, decreased [illegible] in sheep and lambs, remained [illegible] in hog production, and increased rapidly in broiler chickens and turkey production.

Beef Cattle

The production of cattle and calves has increased steadily since 1950 despite a decline in numbers of [illegible] beef cattle during the years 1956 to 1960 (Table 21). Beef production on California range has [illegible] of the early 1950's. Much of the range, in fact, was overstocked during 1955 and 1956 which explains the later decline in range cattle numbers. Beef production not only has been maintained but has increased due to an upward trend in shipments of stockers and feeders and a steady expansion in dairy calves. (About one-fifth of California's beef production is from dairy herds.) Expansion in feeder cattle has been based to some extent on dry lot feeding but on a greater extent on irrigated pasture feeding. The three-fold increase in irrigated pasture acreage was noted in an earlier section.

The expansion of irrigated pastures has permitted an increase in production of grass fat cattle which find a ready demand in local beef markets. The

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[10] The Livestock Subcommittee was responsible for the information in this section and the following section, Changes in Technology of Livestock Production. Members were [illegible] (Chairman), [illegible], [illegible], and [illegible] Baker.

TABLE 13

California Cattle and Calves; Index Numbers of Inventory, Inshipments, Slaughter, and Net Production for 1937-1950 and Projected 1955 Attainable (1937-1941 = 100 Per Cent)

Year	Number of beef animals	Number of dairy animals	Inshipments		California stock slaughter	Total slaughter	Net production
			Stockers and feeders	For direct slaughter			
1937-1941	100	100	100	100	100	100	100
1942	113	114	83	137	108	114	117
1943	123	118	84	118	90	96	118
1944	128	122	105	176	123	134	117
1945	123	124	161	210	130	147	131
1946	124	125	132	204	138	152	127
1947	120	128	161	169	156	158	134
1948	108	126	147	148	131	135	130
1949	104	128	130	134	139	138	139
1950	101	129	203	134	125	127	155
1951 (estimated)	114	130	213	a/	a/	a/	156
1955 attainable	140	131	258	a/	a/	a/	172

a/ Not estimated.

Sources: Estimates for 1937-1950, Bureau of Agricultural Economics; projections for 1955 attainable, California committee.

Table 12

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

trend toward more inshipped feeder stock has permitted an even greater increase in net live weight production because relatively less California feed is now required for maintenance of breeding herds.

The number of beef cattle in 1950 was about the same as in 1941, and the expansion from 1950 to 1951 was comparable to that from 1941 to 1942. It is reasonable to assume that this is the upswing of the cattle cycle, but the start is at a higher level of beef cow numbers, 559,000 compared with 470,000 in 1940. The last high point was reached in 1944 with 658,000 head. The range will now carry more breeding cows because fewer yearlings and two-year-olds are on the ranges, because there are fewer range sheep, and because some of the range has been improved. The committee expects some further range improvement by 1955, and, therefore, it projected the number of beef cows (two years old and over) at 670,000 head for the 1955 attainable (Table 14).

"Cattle put on feed" is not a well-defined category in California or in other western states. West Coast markets accept grass fat cattle with far less price discrimination compared with grain fed cattle than do eastern markets. Many cattle in California, therefore, are marketed for slaughter direct from the range, or are fattened on irrigated pasture with or without supplemental concentrates. Some of the cattle on irrigated pasture at any one time will go directly to slaughter while others will go to native range, to crop residue pasture, or to dry lot feeding. The committee's estimate of 650,000 "cattle put on feed" during 1950, 900,000 during 1951, and 1,000,000 during 1955 attainable includes all dry lot fed cattle plus the estimated proportion of cattle on irrigated pasture that went or will go direct to slaughter.

The number of stocker and feeder cattle and calves shipped into California in 1950 was 953,000 head and the estimate for 1951 is 1,000,000. The 1955 attainable level of 1,200,000 head continues a well-established trend and is in line with expected expansion in irrigated pastures. A recent trend which is expected to continue is for the inshipments to consist of younger, lighter weight animals and of fewer two-year-old steers. The younger, lighter weight animals are preferred for use on irrigated pastures.

Sheep and Lambs

Range sheep numbers and production, after reaching a peak in 1944, have declined steadily. Interest in farm type sheep has been renewed, however, during the past year or two. Range sheep declined during World War II due to the shortage of herdsmen, the overstocked condition of the range, and because ranchers feared a postwar depression in the sheep and wool business.

This trend was reversed during 1950 and in 1951, for the first time since 1942, on January 1 there were more sheep on farms than a year earlier (Table 14). The number, 1,867,000 head, is still relatively low--704,000 below the 1940-1949 average and 1,257,000 below the 1930-1939 average. Indications are that range sheep numbers are continuing to decrease while farm flocks are increasing. These trends have been observed in the annual inventories elsewhere in the United States for the past two or three years. Sheep numbers have been reduced in the typically range states and increased in the typically "domestic sheep" states.

Open and Close

TABLE 14

California Livestock Numbers and Production, and Livestock Product Production, 1950, 1951, and Projected 1955 Attainable

Item of livestock and livestock products	Unit	Reported for 1950	Reported or estimated for 1951	1955 attainable
		1,000 units		
On farms, January 1				
Horses, mules and colts	number	116	114	100
Cattle and calves, all	number	2,709	2,872	3,200
Cows kept for milk, two years plus	number	903	885	910
Other cows, two years plus	number	559	597	670
Sheep and lambs, all	number	1,819	1,867	2,157
Ewes, one year plus	number	1,340	1,367	1,600
Hens and pullets	number	21,314	21,444	23,400
During year				
Sows farrowed, spring	number	81	85	85
Pigs saved, spring	number	502	536	544
Sows farrowed, fall	number	66	68	70
Pigs saved, fall	number	409	422	448
Chickens raised (excluding commercial broilers)	number	28,470	32,456	36,000
Commercial broiler production	number	23,484	27,000	36,000
Turkeys raised	number	7,035	8,000	12,000
Cattle put on feed[a/]	number	650	900	1,000
Average number of laying hens and pullets	number	17,382	17,400	19,000
Sheep and lambs put on feed[a/]	number	180	215	215
Milk cows, average during year	number	813	813	840
Calves born	number	1,126	1,140	1,340
Lambs saved	number	1,219	1,258	1,490
Cattle and calves shipped in (not for immediate slaughter)	number	953	1,000	1,200
Sheep and lambs shipped in (not for immediate slaughter	number	610	975	800
Hogs shipped in (not for immediate slaughter)	number	10	10	10
Milk produced	pound	6,024,000	6,025,000	6,550,000
Eggs produced	dozen	269,417	270,000	300,000
Wool produced	pound	15,547	16,024	18,300
Chickens raised	pound	90,682	103,200	119,000
Commercial broiler production	pound	79,846	91,800	127,500
Turkeys raised	pound	144,921	155,000	177,000
Net production, cattle and calves	pound	860,460	865,000	950,000
Net production, sheep and lambs	pound	99,581	104,000	118,000
Net production, hogs	pound	176,170	185,000	192,000

a/ Twelve-month period beginning October 1.

Sources: Form 10, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.

The committee feels reasonably certain that farm flocks will continue to increase and has projected the January 1, 1955 attainable number of all sheep and lambs on farms at 2,157,000 head, 15 per cent above the 1951 number. The 1955 attainable number of ewes one-year-old and over is 1,600,000, an increase of 17 per cent over 1951.

California's maximum potential capacity for carrying sheep is much greater than indicated by these projections. More complete use of a considerable amount of foothill pasture and crop residue would permit further sheep expansion. It would mean that a given band of sheep would use several kinds of land and feed in physically separated locations during the year and, hence, would be moved from one ranch or area to another. Such a movement would require advance planning and contract leasing of the pasturage. Some persons estimate than from 1 to 2 million additional sheep could be accommodated in this way. However, the committee does not contemplate any substantial amount of this activity will develop in the next few years because of the many attendant problems. Any such activity and consequent expansion would be in addition to these projections.

The ambiguity of the term "put on feed" is even more pronounced for sheep and lambs than for cattle when applied to western conditions. The number officially reported "on feed" on specific dates includes both feed lot and irrigated pasture operations; animals in breeding flocks on irrigated pasture are excluded as far as possible. Actually, only a small proportion of California's lambs receives any dry lot feeding. A much larger proportion is marketed direct from grass--either range, irrigated pasture, or various other kinds of pasture. The committee estimated that 215,000 sheep and lambs would be put on feed in 1951 and in the 1955 attainable compared with 180,000 in 1950. None of the increase will be in dry lot feeding.

Net production of sheep and lambs in California was reported at 99.6 million pounds in 1950. The committee projected a 1955 attainable of 118 million pounds.

Dairy Cows and Milk Production

Milk cow numbers and total milk production have fallen behind population growth in California. The number of dairy cows on farms was the same in 1951 as in 1948 and 1949 (Table 14). The supply of market milk and cream has been maintained, however, by diverting milk from manufactured to fluid use. The number of dairy cows on farms January 1, 1951 was 885,000 head which was a reduction of 13,000 from a year earlier. Dairy cow inventories had declined during 1950 due mainly to heavier-than-usual culling of low producers. Such culling was stimulated by very high prices for slaughter cattle and by increasing production costs. The average number of 813,000 cows milked during 1951, remained equal to a year earlier. The committee projects January 1 inventories at 910,000 head and the average number milked at 840,000 for the 1955 attainable.

Milk production per cow increased steadily from 1942 when it averaged 265 pounds of milk fat per cow until 1950 when it averaged 289 pounds. The committee projects a further increase in production per cow to 300 pounds for the 1955 attainable. Some shift in breeds from Jerseys and Guernseys to

Holsteins is expected; this will mean a larger increase in production of milk than of milk fat. The 1955 attainable yield of milk per cow would be 7,798 pounds compared with 7,410 in 1950. Thus, the 1955 projected total production of milk will be 6,550 million pounds compared with the 1950 production of 6,024 million and a 1951 estimate of 6,025 million pounds.

Horses and Mules

The committee estimated that numbers of work stock will continue to decline at about the rate of recent years and that the 1955 projected number will be 100,000 compared with 116,000 on January 1, 1950 and 114,000 in 1951 (Table 14). These estimates, insofar as possible, do not include pleasure riding horses. The number of pleasure horses probably has increased in recent years.

Hogs

California regularly raises one-third and ships in two-thirds of all the hogs it slaughters. In addition, large quantities of cured meat, hams and bacon, and fresh pork are shipped into the state. California producers marketed about 800,000 hogs in 1950 (431,000 under inspected slaughter) while inshipments for immediate slaughter equalled an additional 1,630,000 head (Table 14).

Considering physical resources along, California could produce many more hogs than it does now. Our producers have the advantage of almost year-round pasture and a large local market. Moreover, hogs can be produced economically on feed grains other than corn. The deficit feed grain situation means, of course, that grain prices are relatively high. The main reason why hog production has not increased more than it has probably is that alternative means of converting feed into meat have appeared more profitable to farmers.

Hog production probably will tend to increase, but the committee could see no indication of any major expansion by 1955 and so the 1955 attainable production is set at approximately current levels.

Commercial Broilers

Two outstanding developments in poultry since 1940 have been the large expansion in production of commercial broilers and fryers (291 per cent) and in turkeys (109 per cent). Both products have been increasingly attractive to consumers because of their relatively lower retail prices compared with "red" meats since World War II and because of their improvement in quality.

California produced 23 million broilers in 1950 as compared with 6 million in 1940--almost a four-fold expansion in ten years. This phenomenal growth of the broiler industry during and since World War II has resulted directly from favorable meat-feed price ratios coupled with generally increased production efficiency (Table 15). Price ratios are favorable because of the strong demand for chicken meat. The improvements in technology and efficiency have permitted volume production of broilers at reasonable costs.

TABLE 15

California Poultry; Index Numbers of Inventory Hens and Pullets, Chickens, Broilers and Turkeys Raised and Eggs Produced 1937-1950, and Projected 1955 Attainable (1937-1941 = 100 Per Cent)

Year	Hens and pullets January 1	Eggs per layer	Eggs produced	Chickens raised	Broilers raised	Turkeys raised
1937-1941	100	100	100	100	100	100
1942	110	105	111	129	152	110
1943	116	100	123	153	213	135
1944	129	110	140	119	177	160
1945	114	106	127	152	274	194
1946	122	108	130	112	186	155
1947	114	114	132	119	246	137
1948	122	118	145	116	293	158
1949	129	118	165	134	386	239
1950	149	122	179	127	437	237
1951 (estimated)	150	121	179	145	507	269
1955 attainable	163	124	199	161	669	404

Sources: Estimates for 1937-1950, Bureau of Agricultural Economics; projections for 1955 attainable, California committee.

Table 25

Construction Industry: Index numbers of employment hours and earnings,
Ontario, 1971-1975 and Toronto, 1971-1975 and 1976 January-August
(1971-1975 = 100 per cent)

Item	Employment hours	Wage rate	Earnings	Average hourly earnings	Average weekly earnings
1971-1975	100	100	100	100	100
1971	100	100	100	100	100
1972	114	108	113	105	119
1973	124	120	119	113	134
1974	138	140	139	127	150
1975	118	132	129	114	147
1976	132	139	141	128	164
1975	118	132	132	119	151

The committee tentatively projected the 1955 attainable production at 36 million broilers and fryers. Actually, there is no rational basis for predicting at what level or when commercial broiler production will cease to expand under the assumed income and price conditions.

Turkeys

The statements regarding (a) consumer demand and (b) increased technology and efficiency for broilers also apply in large measure to turkeys. An added important factor is extending the marketing season over much of the year in contrast to its earlier seasonal orientation.

Almost all the turkeys produced in California until very recently were broad-breasted bronze which in the last five years have averaged approximately 20 pounds per bird. In 1950, growers produced about 400,000 Beltsville small whites. These much smaller birds, averaging 6-10 pounds, are gaining in popularity because they are suited to consumers who will not accept the larger turkeys. The committee expects that a large part of the further expansion in turkey production will be in the Beltsville whites. The committee projected the 1955 attainable production of both kinds of turkeys at 12 million birds compared with 7 million in 1950. The production in pounds would be 177 million, 14.8 pounds per bird, compared with 1950 production of 144,921,000, 20.6 pounds per bird. This change in average market weight of turkeys is reflected in average feed requirements (Appendix Tables 11 and 12).

Eggs

The shifts in production during the last ten years have been economically sound for the best interests of California's livestock and poultry producers, and it is logical for these trends to continue. It is more profitable to use expensive imported feed grains to produce poultry, eggs, and milk--uses which return a high value product per pound of grain. It would not be equally profitable, in terms of existing or assumed conditions, to expand grain use in producing hogs or fattening cattle or lambs. It is profitable, however, to produce on irrigated pastures as much as possible of the additional beef and lamb needed.

California had in 1950 almost 50 per cent more hens and pullets on farms than in the 1937-1941 prewar period (Table 15). The average rate of lay also had increased from 153 to 186 eggs per bird. As a result, total egg production in 1950 was 79 per cent above the prewar level. Meanwhile, California's human population had increased during the 1940's by roughly 53 per cent. California's per-capita production of eggs, not considering eggs used by hatcheries, was 255 in 1940 and 305 in 1950. Even though egg production has increased more rapidly than population, the state is still a deficit egg-producing area. It is estimated than some 1.2 million cases, or about 40 eggs per capita, were shipped into the state in 1951.19/

19/ California's per-capita consumption is not known; United States per-capita consumption was about 410 eggs in 1951.

The committee projected the January 1, 1955 attainable at 23,400,000 hens and pullets compared with 21,444,000 in 1951--an increase of 9 per cent. The 1955 attainable egg production was projected at 300 million dozen compared with 270 million--an increase of 10 per cent. The rate of lay in 1955 would be 189 eggs per average layer during the year compared with 186 per layer in 1950.

Chickens raised, excluding broilers, have not kept pace with laying flocks. The number of chickens raised in 1950 was 27 per cent above the prewar (1937-1941) average compared with a 49 per cent increase in laying flocks (Table 15). Some of this growing deficit in production of farm chickens has been closed by expanded broiler production. The committee projected the 1955 attainable number of chickens raised at 36 million compared with 32.4 million in 1951.

CHANGES IN TECHNOLOGY OF LIVESTOCK PRODUCTION

The subcommittee found no statistical basis to estimate and evaluate production implications of important changes in livestock technology by 1955 for beef cattle, sheep, or hogs. Hog production, as noted, is relatively low in the state while cattle and sheep production are closely correlated with physical resources and the production of grazing and other feed (Table 14). Improved breeding and disease and parasite control already have effected a tremendous improvement in the efficiency of producing livestock. There is a potential for further increased efficiency in meat production to result from progress in pasture utilization both on ranges and farms. However, specific evaluation of these influences was not deemed possible. Data were available to project estimates of increased efficiency from new technology for dairy cows and poultry meat.

Broilers and Turkeys

Three improvements in technology common to broilers and turkeys that are attainable by 1955 are: (1) Increasing efficiency of the birds in converting feed into meat is expected to reduce the pounds of feed (required) per pound of meat--6 per cent for broilers and 4 per cent for large turkeys. (2) The time required to produce a bird of marketable weight is expected to be reduced 8 per cent for broilers and 6 per cent for frying turkeys. (3) Improved disease and parasite control is expected to cut death losses 11 per cent for broilers, 13 per cent for large turkeys, and 17 per cent for frying turkeys.

Milk Cows

Improvements are expected by 1955 in the feeding of milk cows. An increase in concentrate feeding, from 1,200 to 1,300 pounds per cow, and an increase in pasture of .1 animal unit month (AUM) per cow is expected to increase production of milk from 6,700 to 7,200 pounds.

[illegible]

[illegible]

[illegible]

APPENDIX TABLE 1

California Field Crop Acreage; 1950, 1951, and Projected 1955 Attainable

Use of farm land	Acreage	Reported for 1950	Reported or estimated for 1951	1955 attainable
		acres		
Corn, all	planted	86,000	69,000	80,000
Sorghums for grain	planted	136,000	101,000	110,000
Cotton, all upland	planted	586,500	1,341,000	1,250,000
Sugar beets	planted	218,000	149,000	175,000
Early Irish potatoes	planted	78,000	49,000	50,000
Late Irish potatoes	planted	45,000	35,000	40,000
Beans, dry edible	planted	319,000	339,000	320,000
Safflower	planted	27,000	16,000	16,000
Castor beans	planted	2,400	20,000	20,000
Hops	planted	9,400	9,400	9,400
Other intertilled crops, total		751,000	772,700	760,000
Stock beets, etc.		(5,000)	(5,000)	(6,000)
Vegetables		(613,200)	(667,700)	(654,000)
Miscellaneous		(132,800)	(100,000)	(100,000)
Total intertilled		2,258,300	2,901,100	2,830,400
Adjustment for multiple use[a]		383,300	444,100	435,900
Total cropland used for intertilled crops[b]		1,875,000	2,457,000	2,394,500
Oats for grain	harvested	196,000	163,000	169,000
Oats for hay	harvested	332,000	279,000	314,000
Barley for grain	harvested	1,800,000	1,494,000	1,730,000
Barley for hay	harvested	401,000	417,000	397,000
Winter wheat	planted	710,000	710,000	710,000
Flaxseed	planted	60,000	62,000	60,000
Rice	planted	240,000	319,000	250,000
Total cropland used for close-growing crops		3,903,000	3,619,000	3,777,000
Alfalfa	harvested	1,058,000	931,000	1,150,000
Other	harvested	159,000	159,000	160,000
Grain hay	harvested	733,000	696,000	711,000
Alfalfa seed	harvested	115,000	77,000	90,000
Ladino seed	harvested	35,000	45,000	55,000
Purple vetch and peas seed	harvested	67,000	67,000	65,000
All irrigated pasture	harvested	682,000	702,000	800,000
Sudan and temporary pasture	harvested	125,000	125,000	135,000
Total cropland used for hay, seed, and pasture crops[b]		2,024,000	1,917,000	2,245,000

(Continued on next page.)

Appendix Table 1 continued.

Use of farm land	Acreage	Reported for 1950	Reported or estimated for 1951	1955 attainable
		acres		
Fruits	harvested	1,367,600	1,374,570	1,405,500
Tree	harvested	(671,700)	(675,050)	(675,500)
Bush	harvested	(3,800)	(3,800)	(4,000)
Grapes	harvested	(485,200)	(487,900)	(500,000)
Nuts	harvested	(202,000)	(203,600)	(220,000)
Strawberries	harvested	(4,900)	(4,220)	(6,000)
All nonbearing fruits		127,400	128,000	128,000
Total cropland used for crops		9,297,000	9,495,570	9,950,000
Summer fallow		1,227,000	1,063,430	960,000
Total cropland[b/]		10,524,000	10,559,000	10,910,000
Wild hay	harvested	177,000	186,000	190,000
Open permanent pasture (non-cultivable)		18,500,000	18,500,000	18,500,000
Woods, pastured		3,300,000	3,300,000	3,300,000
Woods, not pasture		700,000	700,000	700,000
Other land in farms		2,299,000	2,255,000	1,900,000
Total land in farms		35,500,000	35,500,000	35,500,000
Grazing land not in farms:				
Privately owned range		6,500,000	6,500,000	6,500,000
Grazing districts		2,978,775	2,978,775	2,978,775
Other public domain grazing		2,939,740	2,939,740	2,939,740
Indian lands		398,000	398,000	398,000
State lands		155,000	155,000	155,000
Private lands in national forest		1,410,435	1,410,435	1,410,435
National forest grazed		7,657,000	7,657,000	7,657,000
Other land not in farms:				
Forest, other public land		17,737,230	17,737,230	17,737,230
Barren, desert, etc.		25,077,740	25,077,740	25,077,740
Total land area		100,353,920	100,353,920	100,353,920

a/ In making the adjustment for multiple use of land by crops in the same group or in two or more groups, the first use in the crop year is considered to be the primary use.

b/ Total acres used for crops are less than the sum of the acreages of individual crops to the extent that two or more crops were, or will be, planted on or harvested from same land during the year.

Sources: Based on Form 1, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.

APPENDIX TABLE 2

California Truck Crop Acreages; 1950, 1951, and Projected 1955 Attainable

Use of farm land	Reported for 1950	Reported or estimated for 1951	1955 attainable
	acres[a/]		
Asparagus	71,700	70,800	75,000
Cantaloupe:			
Spring (desert)	15,800	16,700	34,000
Midsummer	26,900	24,000	
Total	42,700	40,700	
Honeydews:			
Spring		450	7,000
Summer	6,500	6,800	
Total		7,250	
Carrots:			
Winter	11,600	10,000	
Spring	4,600	3,500	25,000
Fall	10,800	8,300	
Total	27,000	21,800	
Celery:			
Winter	3,500	2,800	
Spring	2,300	2,300	14,000
Summer	1,000	950	
Late fall	7,100	8,000	
Total	13,900	14,050	
Lettuce:			
Spring	31,100	31,300	
Winter	32,700	36,500	124,000
Summer	28,400	21,000	
Fall	37,300	35,000	
Total	129,500	123,800	
Tomatoes:			
Processing	75,524	145,000	120,000
Early spring	3,600	3,800	
Early summer	7,000	8,300	30,000
Early fall	20,000	19,000	
Total	30,600	31,100	
All other vegetables	215,770	213,200	225,000
Total	613,200	667,700	654,000

a/ Harvested acreage.

Sources: Based on Form 1a, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.

APPENDIX TABLE 2

California State Water Projects, 1951, 1952,
and Estimated 1953 Allocations

Type of Fish Load	Reported for 1950	Estimated as Occurring for 1951	1952 Allocation
	Tons		
Anchovetas	11,000	10,000	(8,000
Chanti-cyon			
Jurels (Yellowtail)	2,000	1,500	20,000
Mackerel	20,000	25,000	
Tuna	10,000	10,000	
Sharks:			
Angel		400	1,000
Common	6,500	4,000	
Toyo		1,500	
Sardine:			
Coast	12,000	12,000	80,000
Monterey	6,400	8,000	
Red	10,000	8,000	
Tuna	17,000	22,000	
Corvina:			
Yellow	3,800	5,000	10,000
Spotted	1,400	2,000	
Chano	1,500	1,500	
Lake Fish	1,100	1,000	
Total	12,000	12,000	
Flounder:			
Halibut	21,000	21,000	
Other	1,000	2,000	150,000
Sanddab	1,000	2,000	
Total	23,000	25,000	
Rockfish	2,000	2,000	
Surfperch	2,000	2,000	
Total	4,000	4,000	
Miscellaneous			
Croaker	2,000	2,000	2,000
Kelp Bass	3,000	3,000	
Opaleye	1,000	1,000	20,000
Silver Salmon	2,000	2,000	
Total	20,000	20,000	
All other species	175,000	175,000	200,000
Total	400,000	400,000	500,000

1/ Converted acreage.

Source: State of California, Department of Fish and Game, Bureau of Marine Fisheries; compiled in 1952 and made available by the California Department of Fish and Game.

APPENDIX TABLE 3

California Fruit and Nut Crop Acreage; 1950, 1951, and Projected 1955 Attainable

Use of farm land	Reported for 1950	Reported or estimated for 1951	1955 attainable
	acres[a]		
Almonds	91,296	91,100	100,000
Apples	25,940	26,200	26,000
Apricots	45,719	45,700	42,000
Avocados	11,704	12,900	17,000
Cherries	9,307	9,500	10,000
Figs:			
Fresh, Dried, all	29,220	29,700	28,000
Grapes	485,169	487,900	500,000
Wine	(159,419)	(160,000)	(163,000)
Table	(91,862)	(93,200)	(97,000)
Raisin varieties, fresh, Raisin varieties, dried	(233,888)	(234,700)	(240,000)
Grapefruit	9,954	9,800	9,000
Desert	(3,108)	--	
Other	(6,846)	--	
Lemons	54,418	54,700	55,000
Oranges	211,923	210,800	209,000
Valencia	(132,394)	(132,100)	(131,000)
Navel and miscellaneous	(79,529)	(78,700)	(78,000)
Olives	26,826	27,100	29,000
Peaches	76,902	78,900	83,000
Clingstone	(44,059)	(44,000)	(48,000)
Freestone	(32,843)	(34,900)	(35,000)
Pears	39,321	39,600	40,000
Bartlett	(34,179)	(34,500)	(35,000)
Other	(5,142)	(5,100)	(5,000)
Plums	23,492	24,400	25,000
Prunes	102,814	100,600	98,000
Walnuts	110,784	112,500	120,000
Strawberries	4,900	5,150	6,000
Other fruits	4,145	4,220	4,500
Total all fruits	1,363,834	1,370,770	1,401,500

a/ Bearing acreage only.

Sources: Based on Form 1b, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.

APPENDIX TABLE I

CALIFORNIA FRUIT AND NUT TREE ACREAGE, 1970, 1960,
and Previous 1959 Acreage

Type of Tree Fruit	Reported for 1970	Change from 1960	Change from 1959
	(Acres)		
Almonds	93,000	0,000	10,000
Apples	28,600	20,000	00,000
Apricots	19,700	10,000	0,000
Avocados	0,700	1,000	0,000
Cherries	0,200	0,000	0,000
Figs			
Grapes	69,200	39,000	00,000
Dried, all			
Canning	00,000	00,000	00,000
Olives	(00,000)	(00,000)	(00,000)
Pears	(0,000)	(0,000)	(0,000)
Dwarfs, trellised	(00,000)	(00,000)	(00,000)
Plums, prunes, dried			
Pomegranates	0,000	0,000	0,000
Prunes	(0,000)	(0,000)	(0,000)
Quinces	(0,000)	(0,000)	(0,000)
Tangerines	00,000	00,000	00,000
Walnuts	00,000	00,000	00,000
Young and miscellaneous	(0,000)	(00,000)	00,000
Citrus	00,000	0,000	0,000
Prunes	00,000	00,000	0,000
Plantations	(00,000)	(0,000)	(0,000)
Honeydew	(0,000)	(0,000)	(0,000)
Pears	0,000	0,000	0,000
Persimmons	(0,000)	(0,000)	(0,000)
Quince	(0,000)	(0,000)	(0,000)
Tuna	0,000	0,000	0,000
Other fruits	0,000	0,000	0,000
Total all fruits	1,000,000	0,000,000	0,000,000

Source: Based on Form 1-B, California Crop and Livestock Reporting Service, Department of Agricultural Economics, University of California Cooperative Extension.

Changes: Dash (-) lines are explained by re-classifying from one type to another.

(P) Denotes bearing only.

APPENDIX TABLE 4

Fertilizer by Field Crops; Estimated Use in 1950 and Projected Requirements in 1955 If Projected Acres and Yields of Crops Are Attained

Crop or kind of pasture	1950						
	Acres fertilized[a]			Rate per acre	Quantities used[b]		
	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	$N-P_2O_5-K_2O$	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)
	acres			pounds	tons		
Field corn	24,580	6,072	1,370	64-48-35	790	146	24
Sorghums	32,740	11,355	7,802	38-54-60	618	305	233
Cotton	469,594	119,190	23,700	70-61-13	16,383	3,614	158
Sugar beets	193,645	84,705	22,210	98-89-55	9,460	3,777	616
Potatoes	109,216	65,214	25,485	122-71-57	6,687	2,321	728
Beans	24,679	26,254	3,390	49-53-19	600	698	33
Hops	5,193	3,244	2,570	67-50-30	174	82	39
Small grains:							
Oats	55,551	40,345	7,375	27-24-5	739	487	20
Barley	446,505	174,935	17,700	40-27-15	9,030	2,334	137
Winter wheat	117,120	58,704	3,046	36-30-19	2,111	888	29
Flaxseed	52,640	51,640	--	51-50-0	1,332	1,282	--
Rice	191,296	828	1	40-36-31	3,830	15	--
Alfalfa hay	123,692	407,044	23,048	27-61-13	1,682	12,470	155
Pasture:							
Irrigated	97,366	269,798	8,740	61-53-12	2,980	7,167	52
Dry	7,914	27,155	--	30-50-0	120	676	--
Other field crops	48,339	26,649	2,127	34-32-26	822	431	27
Total	2,000,070	1,373,132	148,564	57-53-30	57,358	36,693	2,251

(Continued on next page.)

Appendix Table 4 continued.

Crop or kind of pasture	1955 attainable						
	Acres fertilized[a]			Rate per acre	Quantities required[b]		
	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	$N-P_2O_5-K_2O$	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)
	acres			pounds	tons		
Field corn	30,000	12,000	2,000	64-48-35	960	288	35
Sorghums	50,000	15,000	10,000	38-54-60	950	405	300
Cotton	1,000,000	400,000	60,000	75-60-15	37,500	12,000	450
Sugar beets	170,000	70,000	20,000	125-90-55	10,625	3,150	550
Potatoes	85,000	50,000	30,000	140-75-60	5,950	1,875	900
Beans	30,000	30,000	4,000	50-55-20	750	825	40
Hops	5,200	3,200	2,600	70-50-30	182	16	39
Small grains:							
Oats	100,000	100,000	--	40-40-0	2,000	2,000	--
Barley	1,000,000	1,000,000	--	40-40-0	20,000	20,000	--
Winter wheat	250,000	250,000	--	40-40-0	5,000	5,000	--
Flaxseed	53,000	52,000	--	51-50-0	1,352	1,300	--
Rice	210,000	--	--	50-0-0	5,250	--	--
Alfalfa hay	150,000	500,000	25,000	30-65-15	2,250	16,250	188
Pasture:							
Irrigated	150,000	350,000	10,000	60-60-10	4,500	10,500	50
Dry	25,000	100,000	--	30-50-0	375	2,500	--
Other field crops	50,000	30,000	2,000	35-35-25	875	525	25
Total	3,358,200	2,962,200	165,600	59-52-31	98,519	76,634	2,577

a/ Individual crops in some cases receive more than one kind of fertilizer--hence, the three columns cannot be summated with the intent of calculating the total acreage fertilized. Total acreage fertilized in some form could not be ascertained from the data available.

b/ Quantities shown are in terms of the "fertilizing constituent," N, P_2O_5, and K_2O, respectively, not in terms of the material applied.

Sources: Based on Form 4, California Survey of Agricultural Productive Capacity. Basic data and projections of 1955 attainable are by the California committee.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX TABLE 5

Fertilizer by Truck Crops; Estimated Use in 1950 and Projected Requirements in 1955 If Projected Acres and Yields of Crops Are Attained

Crop	1950						
	Acres fertilized[a]			Rate per acre	Quantities used[b]		
	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	$N-P_2O_5-K_2O$	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)
	acres			pounds	tons		
Asparagus	13,549	4,100	1,625	81-60-57	549	122	46
Cabbage	6,230	4,521	4,306	101-59-44	314	133	95
Cauliflower	14,002	13,056	10,826	114-86-40	800	559	215
Cantaloupes and other melons	43,385	40,840	20,235	56-89-31	1,216	1,809	318
Watermelons	15,310	14,070	3,370	67-86-26	511	609	45
Carrots	23,122	22,562	12,806	38-68-30	443	770	189
Celery	12,855	11,760	--	345-299-0	2,217	1,759	--
Green Limas	12,180	7,655	5,915	54-48-25	328	184	74
Green peas	4,100	1,740	990	58-59-40	119	52	20
Lettuce	133,986	130,170	89,830	85-80-33	5,721	5,216	1,470
Onions	10,564	8,549	5,403	103-76-52	544	324	141
Peas	3,615	3,484	1,290	58-55-37	104	95	24
Sweet corn	19,432	8,080	4,490	129-70-41	1,253	285	93
Sweet potatoes	8,680	5,835	2,950	68-58-49	295	169	72
Tomatoes (fresh)	41,009	28,129	17,334	68-75-36	1,395	1,056	316
Tomatoes (processing)	42,705	26,980	15,715	70-53-38	1,492	712	298
All other vegetables	49,048	37,804	30,594	83-70-43	2,037	1,315	659
Total	453,772	369,335	227,679	85-82-36	19,338	15,169	4,075

(Continued on next page.)

[illegible]

[illegible] Changes [illegible] in 1970 and Projected
[illegible] in 2000 by Planning Area and Parts of Towns Not Planned

Item	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Appendix Table 5 continued.

Crop	1955 attainable						
	Acres fertilized[a]			Rate per acre	Quantities required[b]		
	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	N-P_2O_5-K_2O	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)
	acres			pounds	tons		
Asparagus	15,000	5,000	2,000	85-60-60	638	150	60
Cabbage	6,500	4,500	4,500	110-60-45	358	141	101
Cauliflower	15,000	13,500	11,000	115-85-40	862	574	220
Cantaloupes and other melons	40,000	40,000	20,000	60-90-30	1,200	1,800	300
Watermelons	15,000	14,000	3,500	70-86-26	525	602	46
Carrots	25,000	25,000	13,000	40-70-30	500	875	195
Celery	14,000	12,000	--	350-300-	2,450	1,800	--
Green Limas	15,000	8,000	6,000	55-50-25	412	200	75
Green peas	4,000	1,800	1,000	60-60-40	120	54	20
Lettuce	124,000	124,000	90,000	90-80-35	5,580	4,960	1,575
Onions	10,500	8,500	5,500	105-75-50	551	319	138
Peas	3,600	3,500	1,300	60-55-40	108	96	26
Sweet corn	20,000	9,000	4,500	130-70-40	1,300	315	90
Sweet potatoes	9,000	6,000	3,000	70-75-35	315	225	52
Tomatoes (fresh)	30,000	30,000	17,000	70-75-35	1,050	1,125	298
Tomatoes (processing)	75,000	50,000	25,000	70-55-40	2,625	1,375	500
All other vegetables	60,000	50,000	40,000	85-70-45	2,550	1,750	900
Total	481,600	405,000	247,300	88-81-37	21,144	16,361	4,596

a/ Individual crops in some cases receive more than one kind of fertilizer--hence, the three columns cannot be summated with the intent of calculating the total acreage fertilized. Total acreage fertilized in some form could not be ascertained from the data available.

b/ Quantities shown are in terms of the "fertilizing constituent," N, P_2O_5, and K_2O, respectively, not in terms of the material applied.

Sources: Based on Form 4a, California Survey of Agricultural Productive Capacity. Basic data and projections of 1955 attainable are by the California committee.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX TABLE 6

Fertilizer by Fruits and Nuts; Estimated Use in 1950 and Projected Requirements in 1955 If Projected Acres and Yields of Crops Are Attained

Crop	1950						
	Acres fertilized[a]			Rate per acre	Quantities used[b]		
	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	$N-P_2O_5-K_2O$	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)
	acres			pounds	tons		
Almonds	47,695	10,104	9,073	75-55-100	1,799	280	452
Apples	15,936	13,161	8,251	64-46-32	508	301	131
Apricots	18,574	10,532	7,000	46-42-291	429	219	1,019
Avocados	17,180	8,330	7,040	152-99-60	1,304	413	210
Cherries	4,256	4,093	4,027	67-47-27	142	96	54
Figs	15,066	1,183	1,160	60-29-22	455	17	12
Grapes	173,655	75,743	42,361	61-38-37	5,350	1,435	793
Grapefruit	9,815	2,361	1,046	207-71-48	1,018	84	25
Lemons	58,576	11,579	6,179	207-128-63	6,054	739	194
Oranges	207,714	38,270	24,445	196-129-72	20,317	2,472	877
Olives	17,446	1,053	1,228	75-67-239	654	35	147
Peaches	67,545	8,340	6,035	97-50-33	3,279	207	101
Pears	19,856	7,979	4,382	66-69-378	657	277	829
Plums	17,636	4,094	3,348	93-50-46	818	103	77
Prunes	36,776	33,149	19,400	60-50-76	1,103	836	736
Walnuts	74,877	5,610	4,067	118-55-32	4,426	155	65
Strawberries	5,234	4,543	4,323	118-102-61	309	233	133
Bushberries	3,832	2,711	2,249	100-56-28	191	76	32
Other fruits	3,195	1,224	822	90-44-8	144	27	3
Total	814,864	244,059	156,436	120-66-75	48,957	8,005	5,890

(Continued on next page.)

Appendix Table 6 continued.

Crop	1955 attainable						
	Acres fertilized[a]			Rate per acre	Quantities required[b]		
	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	N-P_2O_5-K_2O	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)
	acres			pounds	tons		
Almonds	60,000	12,000	10,000	80-60-100	2,400	360	500
Apples	16,000	13,000	8,500	65-45-35	520	292	149
Apricots	18,000	10,500	7,000	46-40-290	414	210	1,015
Avocados	17,000	9,000	7,000	150-100-60	1,275	450	210
Cherries	5,000	4,000	4,000	70-50-30	175	100	60
Figs	16,000	1,200	1,200	60-30-22	480	18	13
Grapes	200,000	80,000	45,000	60-40-40	6,000	1,600	900
Grapefruit	9,000	2,000	1,000	210-70-50	945	70	25
Lemons	55,000	11,000	6,000	210-130-65	5,775	715	195
Oranges	209,000	38,000	24,000	200-130-70	20,900	2,470	840
Olives	18,000	1,100	1,300	75-70-240	675	38	156
Peaches	75,000	10,000	6,500	100-50-35	3,750	250	114
Pears	25,000	10,000	5,000	70-70-380	875	350	950
Plums	20,000	5,000	3,500	100-50-45	1,000	125	79
Prunes	35,000	33,000	19,000	60-50-75	1,050	825	712
Walnuts	90,000	10,000	7,500	120-55-30	5,400	275	112
Strawberries	5,500	5,000	4,500	120-100-60	330	250	135
Bushberries	4,000	3,000	2,400	100-55-30	200	82	36
Other fruits	3,500	1,500	1,000	90-45-10	158	34	5
Total	881,000	259,300	164,400	119-66-75	52,322	8,514	6,206

a/ Individual crops in some cases receive more than one kind of fertilizer--hence, the three columns cannot be summated with the intent of calculating the total acreage fertilized. Total acreage fertilized in some form could not be ascertained from the data available.

b/ Quantities shown are in terms of the "fertilizing constituent," N, P_2O_5, and K_2O, respectively, not in terms of the material applied.

Sources: Based on Form 4b, California Survey of Agricultural Productive Capacity. Basic data and projections of 1955 attainable are by the California committee.

Table 1. [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX TABLE 7

Man-Hours Per Acre of Field Crops;
Estimated Use in 1950 and Projected Requirements
in 1955 If Projected Acres and Yields Are Attained

Crop	1950			1955			Changes 1950-1955		
	Pre-harvest	Harvest	Total	Pre-harvest	Harvest	Total	Pre-harvest	Harvest	Total
	hours								
Corn for grain	18	5	23	17	5	22	-1	0	- 1
Corn for silage	20	10	30	18	8	26	-2	- 2	- 4
Wheat, barley, oats	3	3	6	3	3	6	0	0	0
Rice	7	5	12	7	4	11	0	- 1	- 1
Grain sorghum	11	5	16	11	4	15	0	- 1	- 1
Dry beans	17	6	23	17	6	23	0	0	0
Cotton	40	62	102	36	29	65	-4	-33	-37
Flaxseed	11	4	15	11	4	15	0	0	0
Early potatoes	24	48	72	24	45	69	0	- 3	- 3
Late potatoes	26	55	81	26	50	76	0	- 5	- 5
Sweet potatoes	59	70	129	58	68	126	-1	- 2	- 3
Hops	136	211	347	135	200	335	-1	-11	-12
Sugar beets	58	22	80	52	17	69	-6	- 5	-11
Alfalfa hay	12	14	26	12	12	24	0	- 2	- 2
Grain hay	3	4	7	3	4	7	0	0	0
Wild hay	1	4	5	1	3	4	0	- 1	- 1
Safflower	11	5	16	11	5	16	0	0	0
Castor beans	20	7	27	20	7	27	0	0	0
Ladino seed	10	7	17	10	6	16	0	- 1	- 1
Miscellaneous pasture	13	--	13	13	--	13	0	--	0
Sudan pasture	10	--	10	10	--	10	0	--	0

Sources: Form 7, California Survey of Agricultural Productive Capacity. Basic data are estimates based on enterprise studies conducted by the University of California and studies by the Bureau of Agricultural Economics with data adjusted where necessary to reflect the 1950 situation. Projections for 1955 attainable are by the California committee.

TABLE XXXIV

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX TABLE 8

Man-Hours Per Acre of Truck Crops;
Estimated Use in 1950 and Projected Requirements
in 1955 If Projected Acres and Yields Are Attained

Crop	1950			1955			Changes 1950-1955		
	Pre-harvest	Harvest	Total	Pre-harvest	Harvest	Total	Pre-harvest	Harvest	Total
	hours								
Asparagus	31	66	97	31	62	93	0	- 4	- 4
Cantaloupe	43	38	81	43	38	81	0	0	0
Honeydews	43	38	81	43	38	81	0	0	0
Carrots	60	244	304	55	220	275	- 5	-24	-29
Celery	220	200	420	210	190	400	-10	-10	-20
Lettuce	63	30	93	60	25	85	- 3	- 5	- 8
Tomatoes (processing)	46	150	196	44	130	174	- 2	-20	-22
Tomatoes (marketing)	75	130	205	70	120	190	- 5	-10	-15

Sources: Based on Form 7a, California Survey of Agricultural Productive Capacity. Basic data are estimated based on enterprise studies conducted by the University of California and studies by the Bureau of Agricultural Economics, with the data adjusted by the committee where necessary to reflect the 1950 situation. Projections for 1955 attainable are by the California committee.

APPENDIX TABLE 9

Man-Hours Per Acre of Fruits; Estimated Use in 1950 and Projected Requirements in 1955 If Projected Acres and Yields Are Attained

Crop	1950			1955			Changes 1950-1955		
	Pre-harvest	Harvest	Total	Pre-harvest	Harvest	Total	Pre-harvest	Harvest	Total
	hours								
Almonds	37	52	89	38	45	83	+1	- 7	- 6
Apples	140	59	199	135	60	195	-5	+ 1	- 4
Apricots	115	144	259	110	130	240	-5	-14	-19
Avocados	49	28	77	49	40	89	0	+12	+12
Cherries	44	365	409	44	365	409	0	0	0
Figs	44	87	131	44	87	131	0	0	0
Grapes:									
Wine	36	34	70	36	34	70	0	0	0
Table	77	98	175	77	98	175	0	0	0
Raisin	62	70	132	62	67	129	0	- 3	- 3
Grapefruit	48	46	94	48	44	92	0	- 2	- 2
Lemons	84	158	242	85	150	235	+1	- 8	- 7
Oranges	50	84	134	50	80	130	0	- 4	- 4
Olives	52	104	156	50	110	160	-2	+ 6	+ 4
Peaches:									
Clingstone	167	95	262	160	95	255	-7	0	- 7
Freestone	153	106	259	150	100	250	-3	- 6	- 9
Pears									
Bartlett	99	98	197	95	95	190	-4	- 3	- 7
Others	99	88	187	95	90	185	-4	+ 2	- 2
Plums	62	106	168	62	106	168	0	0	0
Prunes	47	68	115	47	68	115	0	0	0
Walnuts	34	40	74	34	36	70	0	- 4	- 4
Strawberries	290	1,160	1,450	290	1,160	1,450	0	0	0
Nonbearing fruits:									
Tree	43	--	43	40	--	40	-3	--	- 3
Bush	100	--	100	100	--	100	0	--	0
Berries	600	--	600	600	--	600	0	--	0

Sources: Based on Form 7b, California Survey of Agricultural Productive Capacity. Basic data are based on enterprise studies conducted by the University of California Station and studies by the Bureau of Agricultural Economics, with the data adjusted by the committee where necessary to reflect the 1950 situation. Projections for 1925 attainable are by the California committee.

APPENDIX TABLE 10

Man-Hours Per Unit of Livestock;
Estimated Use in 1950 and Projected Requirements
in 1955 If Number and Production are attained

Livestock[a/]	Total		
	1950	1955	Changes 1950-1955
	hours		
Beef breeding cows	15 hours per year per breeding cow	14 hours per year per breeding cow	-1
Cattle on feed	6 hours per year per head	6 hours per year per head	0
Dairy cows	105 hours per year per cow	100 hours per year per cow	-5
Ewes	4 hours per year per ewe	4 hours per year per ewe	0
Lambs on feed	3 hours per year per lamb	2 hours per year per lamb	-1
Sheep shorn	.15 hours per fleece	.15 hours per fleece	0
Sows	55 hours per year	55 hours per year	0
Horses and mules	35 hours per year	35 hours per year	0
Turkeys, breeding	3 hours per year per hen	3 hours per year per hen	0
Turkeys, raised	.6 hours per year per turkey	.6 hours per year per turkey	0
Laying hens	2 hours per year per hen	1.8 hours per year per hen	- .2
Commercial broilers	.15 hours per year per bird	.13 hours per year per bird	- .02

a/ Unit of livestock or livestock production.

Sources: Form 7, California Survey of Agricultural Productive Capacity. Basic data are estimates based on enterprise studies conducted by the University of California and studies by the Bureau of Agricultural Economics, with the data adjusted by the committee where necessary to reflect the 1950 situation. Projections of 1955 attainable are by the California committee.

[illegible]

[illegible] for [illegible] of [illegible]:
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]

[illegible]	[illegible]			
	[illegible]	[illegible]	1955	[illegible]
	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX TABLE 11

California Livestock Feed for the Twelve-Month Period Beginning October 1; Requirements in 1950

Class of livestock	Feed per animal, bird or cwt.					Total livestock and feed					
	Concentrates						Concentrates				
	Grains a/	Seeds and skim milk b/	Commercial by-product c/	Total	Tame and wild hay	Units livestock d/	Grains a/	Seeds and skim milk b/	Commercial by-product c/	Tame and wild hay	Pasture and grazing
	1	2	3	4	5	6	7	8	9	10	11
	pounds					1,000 units	1,000 tons				1,000 AUM's
Horses, mules, colts	600	—	—	600	6,000	114	34.2	—	—	342	502
Milk cows (average during year)	800	—	1,200	2,000	8,000	813	325.3	—	487.4	3,252	3,577
Beef cows	75	—	75	150	1,400	597	22.4	—	22.4	418	6,567
Feeder cattle	500	—	500	1,000	1,000	900	225.0	—	225.0	450	1,350
Other cattle and calves	75	—	75	150	3,000	1,214	45.5	—	45.5	1,821	6,798
Ewes, one year plus	10	—	10	20	160	1,367	6.8	—	6.8	109	3,144
Feeder sheep and lambs	10	—	10	20	160	215	1.1	—	1.1	17	215
Other sheep and lambs	10	—	10	20	160	335	1.7	—	1.7	27	771
Hogs, cwt. net production	280	—	70	350	20	185	25.9	—	6.5	2	18
Hens and pullets	61.9	0.30	12.80	75.0	xxx	23,336	722.0	4.4	148.8	xxx	xxx
Chickens raised e/	15.2	0.12	4.68	20.0	xxx	32,456	246.7	1.9	75.9	xxx	xxx
Commercial broilers produced	8.2	—	3.80	12.0	xxx	27,000	111.0	—	51.0	xxx	xxx
Turkeys raised	70.0	.15	21.90	92.0	xxx	8,500	295.5	.7	94.7	xxx	xxx
Total	xxx	xxx	xxx	xxx	xxx	xxx	2,063.4	7.0	1,166.8	6,438	22,942

a/ Includes corn, sorghums, oats, barley, and wheat fed from any source.

b/ Includes cottonseed fed whole and skim milk (dry basis).

(Continued on next page.)

Appendix Table 11 continued.

c/ Includes oilseed meals, tankage, meat scraps, fish meal, dried milk products, wheat millfeeds, gluten feed, brewers' and distillers' dried grains, hominy feed, alfalfa meal, molasses, beet pulp (dry basis), screenings, garbage, etc., fed as an individual feed or in a commercial mixed feed.

d/ Numbers and net production recorded in Table 10.

e/ Excluding commercial broilers produced.

Sources: Form 11a, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.

APPENDIX TABLE 12

California Livestock Feed for the Twelve-Month Period Beginning October 1;
Projected Requirements for 1955

Class of livestock	Feed per animal, bird or cwt.					Total livestock and feed					
	Concentrates						Concentrates				
	Grains a/	Seeds and skim milk b/	Commercial by-product c/	Total	Tame and wild hay	Units livestock d/	Grains a/	Seeds and skim milk b/	Commercial by-product c/	Tame and wild hay	Pasture and grazing
	1	2	3	4	5	6	7	8	9	10	11
	pounds					1,000 units	1,000 tons				1,000 AUM's
Horses, mules, colts	600	--	--	600	6,000	100	30.0	--	--	300	440
Milk cows (average during year)	800	--	1,300	2,100	8,000	840	336.0	--	546.0	3,360	3,780
Beef cows	50	--	50	100	1,400	670	16.8	--	16.8	588	7,839
Feeder cattle	500	--	500	1,000	1,000	1,000	250.0	--	250.0	500	1,500
Other cattle and calves	75	--	75	150	3,000	1,415	53.1	--	53.1	2,122	7,924
Ewes, one year plus	5	--	10	15	160	1,600	4.0	--	8.0	128	3,760
Feeder sheep and lambs	10	--	10	20	160	215	1.1	--	1.1	17	215
Other sheep and lambs	10	--	10	20	160	392	2.0	--	2.0	31	902
Hogs, cwt. net production	280	--	70	350	20	192	26.9	--	6.7	2	19
Hens and pullets	61.9	0.30	12.90	75.0	xxx	25,800	848.7	4.1	174.7	xxx	xxx
Chickens raised e/	15.2	0.12	4.68	20.0	xxx	36,000	273.6	2.2	84.2	xxx	xxx
Commercial broilers produced	8.2	--	3.80	12.0	xxx	36,000	133.8	--	62.1	xxx	xxx
Turkeys raised	51.4	0.15	18.50	70.05	xxx	12,000	319.8	.9	108.4	xxx	xxx
Total	xxx	xxx	xxx	xxx	xxx	xxx	2,295.8	7.2	1,313.1	7,048	26,379

(Continued on next page.)

Appendix Table 12 continued.

a/ Includes corn, sorghums, oats, barley, and wheat fed from any source.

b/ Includes cottonseed fed whole and skim milk (dry basis).

c/ Includes oilseed meals, gluten meal, tankage, meat scraps, fish meal, dried milk products, wheat millfeeds, gluten feed, brewers' and distillers' dried grains, hominy feed, alfalfa meal, molasses, beet pulp (dry basis), screenings, garbage, etc., fed as an individual feed or in a commercial mixed feed.

d/ Numbers and net production recorded on Table 14, last column (1955 attainable).

e/ Excluding commercial broilers produced.

Sources: Form 11b, California Survey of Agricultural Productive Capacity. Basic data are estimates by the California Crop and Livestock Reporting Service; projections of 1955 attainable are by the California committee.